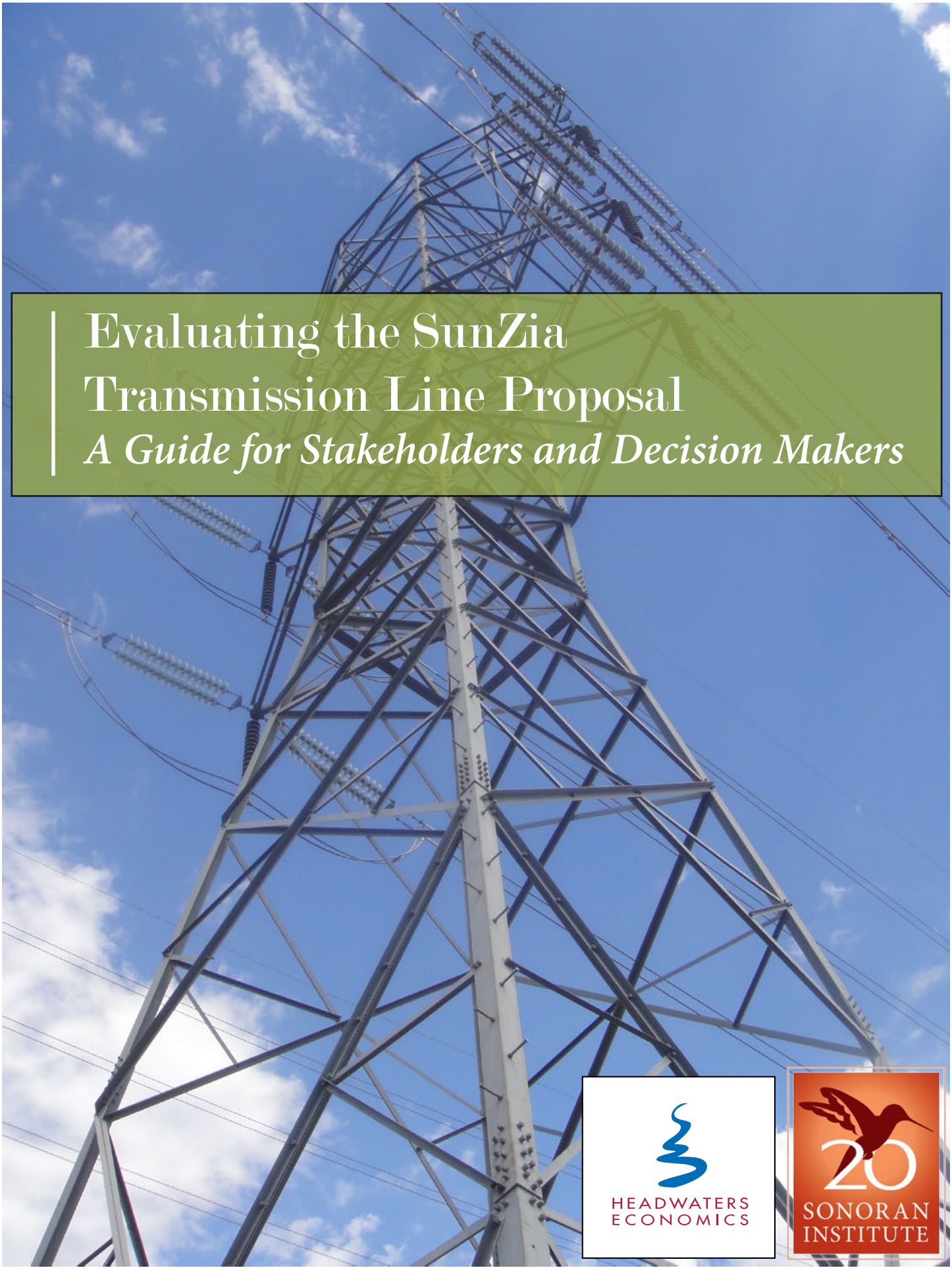

Evaluating the SunZia Transmission Line Proposal

A Guide for Stakeholders and Decision Makers

HEADWATERS ECONOMICS

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We welcome your feedback on the report's findings as well as on how future reports assessing purpose and need for other proposed transmission projects could be improved upon.

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Introduction

High-voltage transmission lines are major industrial projects that have significant impacts on the communities and landscapes through which they are built. The rationale for new high-voltage transmission lines is a key concern for many public stakeholders and decision makers as they weigh the costs and benefits of proposed projects. This report describes the market and policy factors affecting the demand for the proposed SunZia transmission line project. The aim of this report is to contribute transparent, unbiased analysis to better inform the perspectives of stakeholders and decision makers.

As proposed, the SunZia project involves the construction of two high-voltage transmission lines extending from Lincoln County in central New Mexico to Pinal County in south-central Arizona, as well as up to four new substations that would allow power to be added to, or taken from, those lines. The developers of the project have focused primarily on building two alternating current (AC) lines with 3,000 MW of transmission capacity but have also planned for the possibility that one of the two lines could be built as or later converted to a direct current (DC) line. In that event, the project's capacity would be up to 4,500 MW.

In May 2012, the U.S. Bureau of Land Management (BLM) released a Draft Environmental Impact Statement (DEIS) for the SunZia project. The next step in the National Environmental Policy Act (NEPA) process, a Final EIS, is currently planned for Fall/Winter 2012.[1] Although the DEIS discusses purpose and needs for the project, its scope does not include detailed analysis of the market and policy factors shaping the SunZia proposal. This report inserts market and policy analysis into the public discussion about SunZia and in this way may supplement the NEPA process. It is not intended as a substitute for any part of the Draft or Final EIS reports. This report does not address economic or environmental impacts of construction of the SunZia project; those impacts are discussed in the DEIS and subsequent public comments.

As offered by the project developers and restated in the DEIS, the SunZia transmission line project has three primary benefits. One is increasing transmission capacity, thereby relieving existing congestion and allowing additional electric power to be generated and transported to large markets in the Southwest, particularly Arizona and California. Second is offering a transmission alternative for renewable and other generation projects that are seeking access to the grid. The third benefit is assisting utilities in meeting state-mandated obligations to procure renewable energy.[2]

This report draws on publicly available, credible resources to explore each of the project's stated benefits. The first section of the report describes the overall context for the project—its history, the particular opportunities and challenges associated with the merchant transmission line business model, and other transmission projects proposed in the region. The next three sections take up issues associated with available capacity and reliability issues on the electric grid in the SunZia corridor; what types of new electricity generation might develop because of SunZia's construction; and how state renewable portfolio standards in New Mexico, Arizona, and California affect the market for transmission service on the SunZia transmission line. The final section reprises key findings and offers conclusions where possible.

The policies, economics, and politics surrounding interstate transmission lines are in flux. The market situation has changed since the SunZia project was first proposed and will likely change again before the project, if built, is eventually energized. Furthermore, it is difficult to be precise about existing policies that shape power markets, because they are implemented within a dynamic and complex arena. The strategy in this report is to provide guideposts to the market and policy issues affecting the project.

Project Background and Business Model

The SunZia project would be a merchant line, that is, one built and owned by third-party investors. The majority ownership of SunZia is by private developers, but the investment group also includes investor-owned and public power utilities, and energy generators. The business model for merchant transmission projects is predicated on unmet demand for transmission capacity. While merchant-project developers can seize on opportunities to serve transmission demand in areas beyond the defined service areas of utilities, they cannot rely on guaranteed cost recovery from ratepayers (as utilities can). This makes merchant projects risky and extra sensitive to the protracted time frames that are typical for the development of major interstate high-voltage transmission lines.

Project Background

The SunZia transmission project was initially conceived by SouthWestern Power Group, a private project development firm established in 1999 and owned by the MMR Group, a major multinational private holdings company. SouthWestern Power is the original developer of a 2,300 MW natural gas power plant located near Gila Bend, Arizona, that began full commercial operation in 2003 and of a proposed, fully permitted, but yet to be constructed 1,000 MW natural-gas power plant near Bowie, Arizona.

As envisioned in its early stages (2005–2008), the SunZia transmission project was designed to provide additional interconnection opportunities for the Bowie gas plant,[3] but as project planning proceeded additional opportunities to sell transmission to renewable resource generators,

primarily wind farms in New Mexico, were also identified.[4] By September 2008, the planning area for SunZia had expanded to include a swath of central New Mexico where more than 11,000 MW of developable wind resources have been identified.[5] As a result, the project's starting point was moved from southwestern New Mexico to central New Mexico. During planning stages, the project's route was also adjusted based on input from regional utilities concerning opportunities to maximize the project's benefits to the existing transmission grid.

As of 2008, the core group of investors in SunZia had expanded to include ECP SunZia (a limited-liability corporation), Tucson Electric Power Company (an investor-owned utility), and Shell WindEnergy (a subsidiary of Shell Oil). The core group currently commands 86 percent of total interest in the project, with MMR the majority owner at 80 percent.[6] The investor group also secured agreements for co-sponsorship of the line from two public power utilities, Salt River Project (SRP) and the Tri-State electric cooperative, which own 13 percent and 1 percent of the project respectively. The investors operate under a Memorandum of Agreement committing the parties to invest a total of $26 million in initial project development costs at their respective levels of participation.

The SunZia transmission project proposal entered the energy market at a turbulent time. The Great Recession reduced overall demand for energy. At the same time, federal and state policies were seeking to stimulate renewable energy development. The latter received a significant boost in the American Recovery and Reinvestment Act of 2009, which provided for both federal loan guarantees and direct grants to projects. In the intervening years, renewable energy has emerged as a contentious partisan issue. This fact, along with pressures to reduce the federal deficit and do away with industry-specific tax breaks, makes the outlook unclear for supportive federal programs such as the Energy Investment Tax Credit (ITC) and the Production Tax Credit (PTC).

And while downward cost trends within the solar and wind industry are likely to make these renewable technologies more competitive in the long term,[7] for now natural gas prices are near historic lows. As a result, natural gas is projected to capture more than half of the growth in energy generation capacity from 2011 through 2035 nationwide.[8] These market and policy issues are discussed in detail in sections 3 and 4 of this report.

How Is the SunZia Route Planned and Evaluated?

The SunZia project developers have engaged in various regional transmission planning processes, as do any transmission developers working on major new projects. These efforts are intended to identify transmission infrastructure needs, including new lines or enhancements to existing ones, and coordinate planning of the grid system at regional and state levels. In SunZia's case, such engagements date back to 2006 and have focused on WestConnect's Southwest Area Transmission planning group and the Western Energy Coordinating Council (WECC).[9] They primarily involved studies and peer reviews of the project's impact on the congestion and reliability of the grid system, and identification of the project's transfer capability. More information on the results of those studies is provided later in the report.

Since 2009, the SunZia transmission line project proposal has been subject to an environmental assessment process as required under the National Environmental Policy Act. This process is required because the SunZia developers need a permit for a right-of-way across federal lands. The BLM is the lead agency conducting the assessment and is involving 13 other cooperating agencies, including the U.S. Fish and Wildlife Service, Bureau of Reclamation, U.S. Army Corps of Engineers, the New Mexico State Land Office, and the Arizona State Land Department, as well as other state, tribal, and local governments. When the BLM publishes a Final EIS, if the agency recommends approval of a route for SunZia, the company will then initiate state siting processes in both Arizona and New Mexico.

In October 2011, SunZia was selected by the Obama administration as one of seven transmission projects to undergo streamlined federal permitting based primarily on improved interagency coordination at the federal, state, and tribal level. These projects were selected because of their job-creation potential and their ability to enhance grid reliability and the integration of renewable resources.[10]

Also overseeing SunZia is the Federal Energy Regulatory Commission (FERC), which regulates interstate transmission of electricity, gas, and oil. As part of its responsibilities, FERC is required to review and approve the ownership structure and service plans for proposed transmission projects. These plans detail how project owner-investors will allocate ownership rights and sell transmission capacity to prospective customers. One of the core intents of FERC oversight is to ensure that access to a proposed line is offered in a fair and open manner with no preferential treatment provided to one or more customers.

As noted in the accompanying sidebar, transmission planning, permitting, and construction is a long-term endeavor. SunZia has been in the planning process for more than seven years. The NEPA process may extend beyond 2012, and the project must still gain state and local approvals before proceeding. In the interim, the project will have to secure other customers in order to move from a planning to a construction phase.

How Is SunZia Different from Typical Transmission Lines?

The SunZia project is a merchant line, one that is built and owned by third-party investors. Merchant lines are typically initiated by investment partnerships. These can include specialists in transmission development, entities unrelated to the energy sector, public utilities, and independent power producers.[11]

The business model for merchant transmission projects is based on demand for transmission capacity that cannot be or is not being met by incumbent utilities. One advantage that utilities have over merchant projects is the ability to pass on the costs of infrastructure development to a captive customer base. Capital investment costs can be assigned to rates paid by the end users of their services (e.g., homes, businesses, industrial concerns, governments, or other public entities). In contrast, the merchant model hinges on securing customers for transmission service that are willing to commit to terms and conditions that will attract adequate up-front investment and can be expected to generate an acceptable return on it.

Transmission Development Timelines

A key challenge in planning and evaluating electric transmission infrastructure development is timing. Energy markets move quickly, changing in a period of months, while major infrastructure projects like interstate transmission lines can take 10 or 15 years from conception to completion. The lack of certainty about when and where transmission infrastructure will be built results from lengthy permitting processes and the associated challenges of identifying sources of financing that can accommodate long, sometimes indefinite development horizons. A related complication is a chicken-and-egg scenario in which generation developers seek certainty about transmission prior to pursuing projects, while transmission developers seek certainty about generation projects in order to justify their investments in transmission infrastructure.

One dynamic that exacerbates uncertainty around transmission development is the challenge in predicting western electricity markets—a challenge heightened by the Great Recession. In the past few years, anticipated demand for energy has been ratcheted down by regional planning entities like WECC. In addition, establishing the specific demand for out-of-state renewable resources by the West's largest market, California, remains a complicated policy analysis task.[12] While affected stakeholders seek certainty about market demand for transmission service from specific energy resource types, the market and policy analyses at their disposal are near term and poorly suited to the lengthy time lines associated with transmission permitting and construction.

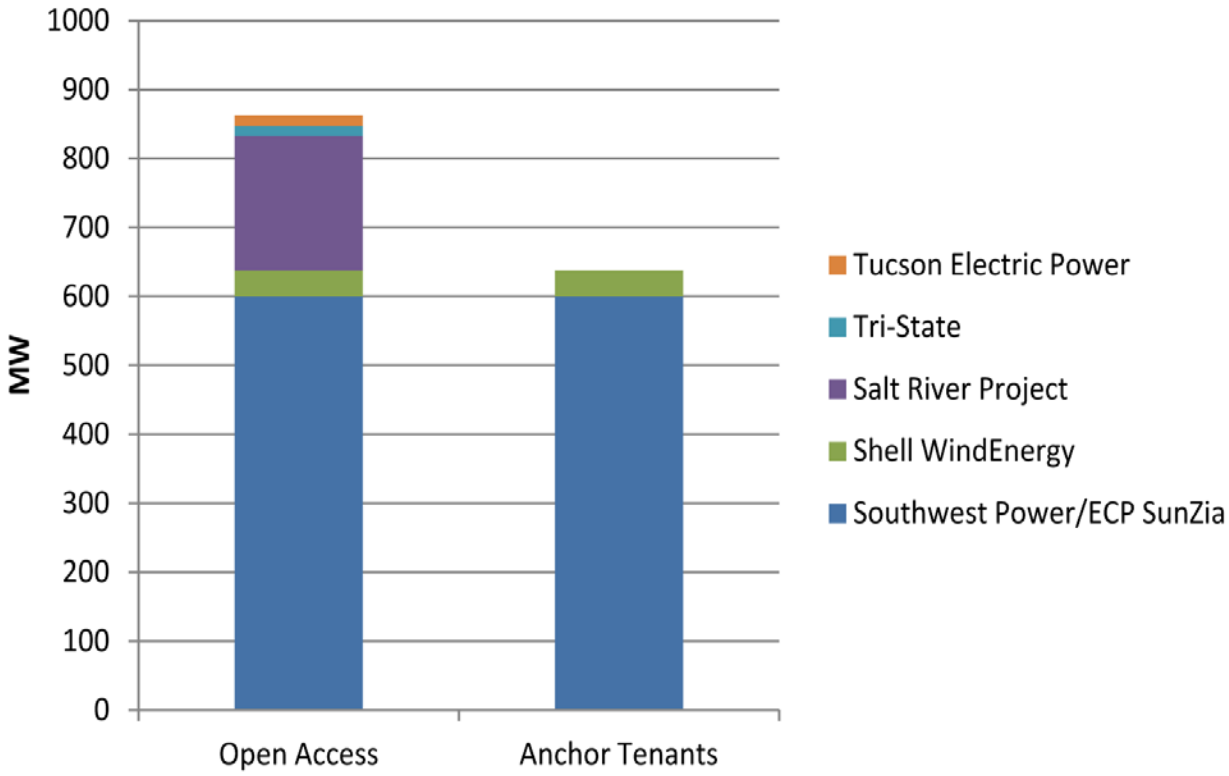
Although transmission line proposals often have a long shelf life, the permitted routes can be valuable assets for companies even if many years pass before market conditions mature sufficiently to support project development. In the intervening time, market demand for types of electricity can change completely. For example, the One Nevada Transmission Line project, which broke ground for one segment of a major 500 kV intertie between southern and central Nevada in 2010, is being built on a right-of-way originally acquired in the early 1990s by Idaho Power, an investor-owned load-serving entity in Idaho. In the late 1980s and early 1990s, Idaho Power was focused on linking new coal-fired power plants to its service areas. After a long latency, the project moved ahead in the late 2000s with a focus on linking renewable energy generation facilities in southern Nevada to the broader western grid system, and on linking the merged Nevada utilities Sierra Pacific and Nevada Power.[13]

Many of the interstate transmission projects reaching key milestones today, like SunZia, had their genesis in the early to mid-2000s, when natural gas prices were reaching record highs and policy support for renewable energy generation was expanding quickly in many states. In 2012, natural gas prices are at near-historic lows, and the continued expansion of policy support for renewable energy resources is less certain than it appeared 10 years ago. In the current environment, it is difficult to predict whether market and policy conditions will make renewable energy competitive with other energy types on a large enough scale to justify service on a particular transmission line. Nonetheless, without expanded transmission access, large-scale renewable energy developers will not have access to markets.

Unlike lines proposed by utilities, which may not reach full utilization for many years after they are first energized, merchant lines must recruit enough customers to fully utilize the line or the line will not be built. A merchant line's financial viability depends on its ability to secure one or more initial customers, known as "anchor tenants," and subsequent customers through an "open access" process. These customers, who purchase a fixed amount of a line's capacity to access and ship power, may be entities that produce or acquire power.

In SunZia's case, FERC is allowing its non-utility investors to secure up to 50 percent of their individual allocations of the line's capacity through one or more anchor tenants.[14] Those tenants are essentially pre-purchasing a percentage of the line's capacity. In doing so, the anchor tenants commit to paying their percentage share of the costs associated with permitting, siting, and other development activities. The anchor tenant model is designed to make merchant transmission easier to develop by demonstrating interest in the line among large, creditworthy customers and spreading the financial risk of the project. Figure 1 shows the amount of capacity the various investors can market to anchor tenants versus customers at large, based on 1,500 MW of capacity.

Figure 1
Possible Allocation of Initial SunZia Transmission Capacity by Owner and Market Process



Source: FERC, Order on Petition of Declaratory Order, 135 FERC ¶ 61,169. This conceptual chart assumes 1,500 MW of initial transmission capacity.

The SunZia project began the anchor tenant process in November 2011. Anchor tenant negotiations are often proprietary at the request of customers (potential anchor tenants). The results of the anchor tenant process are not known at this time. However, once a Transmission Service Agreement is reached, the SunZia management is required to file the terms of the agreement with FERC. Once the anchor tenant process is concluded, SunZia will be required to offer the remaining capacity to customers through an open-access process, offering the same rates, terms, and conditions that were granted to the anchor tenants, provided the customers in the open-access transactions meet credit requirements.

Who Pays for the SunZia Line?

Unlike merchant-line investors, utilities experience little risk in recovering the cost of building transmission lines. Typically, they submit documentation of the need for a new generation facility, transmission line, or distribution system to a state regulatory commission prior to construction. After approval, the regulatory body sets rates for the new project, assuring that its costs will be recovered. For a transmission line, that development cost is bundled into and averaged with the utility's total transmission costs. This bundled and averaged rate is then added to the final rate paid by the end user. On average, transmission costs amount to about 5 percent of the total price of electricity paid by the end user.[15]

Because SunZia is a merchant transmission project, its investors bear the risk of the project along with any contractually obligated anchor tenants. If a sufficient amount of capacity is not spoken for, the project cannot recover its costs. FERC has determined that SunZia's owners may negotiate long-term transmission agreements with its potential customers. These agreements involve negotiated rates that are expected to cover the capital and operating cost of the transmission line. Typically, these negotiated transmission rates are passed on to the purchasing entity (usually a utility), which will in turn pass them on to the end user. The end-user rates are established by a state regulatory commission based on the cost of service to the local utility. As a consequence, the end user pays for the transmission rates through its electricity rates, but the project investors assume the financial risk for the transmission line.

How Do Other Proposed Transmission Lines Compare with SunZia?

In addition to SunZia, two other proposed transmission lines targeting renewable development in New Mexico and Arizona, Southline and Centennial West, are currently going through a NEPA environmental assessment process. Neither is as far along in the permitting process as SunZia is, and each has a significantly different route configuration.

This section briefly describes those two projects, with an emphasis on how they differ from SunZia. (Other power lines have been proposed nearby, but none are as well advanced in the planning process.)

Centennial West

Centennial West is a proposed high-voltage, direct current (HVDC) line running approximately 900 miles, from a high-quality wind resource area in northeastern New Mexico to San Bernardino County, California. Clean Line Energy Partners, a merchant transmission development company, claims that the line will help deliver 3,500 MW of renewable energy to California. The line will also allow up to 500 MW of solar power to be transported from a pickup point in Mohave County, Arizona.[16]

HVDC lines have several distinct advantages over more common alternating current (AC) lines. They need only about a third the width of right-of-way that AC lines require. HVDC can provide a cost-effective, efficient means to move renewable energy from remote locations to faraway population centers. These lines also work well with variable power sources such as wind and solar, since they allow faster and more accurate control of the level and direction of power flows.[17] Because they are synchronized with the AC grid only at the end point, they make the generating sources appear to the grid as though they are located at the end point.

Centennial West also will take advantage of a new technology called voltage source converters. Traditional HVDC allows energy to enter and exit the grid system only at a line's start and end points. In general, additional access points are prohibitively costly and present significant technical challenges. In combination with HVDC, voltage source converters allow for such access points at a more reasonable cost and with fewer technical challenges.

By interconnecting at a terminus in California, Centennial West provides renewable energy generators direct access to the West's largest market. And although DC technology involves higher capital costs than AC, by avoiding intermediary links between generation sites and California, direct delivery reduces the risk of "rate-pancaking," which requires power generators to pay transmission providers along the way. This may be one reason Clean Line Energy Partners currently claims it will offer transmission at a competitive price.[18]

Because Clean Line Energy Partners has yet to identify a specific set of routes to be considered as part of the NEPA process, it is unclear whether there is any overlap between the wind resources that it and SunZia are targeting. Both projects appear to want to develop wind resources within the same renewable energy zone (WREZ) identified by the Western Governors Association.[19] This particular WREZ (NM-EA) has a total capacity of 11,290 MW, which could accommodate both projects. The lack of specifics on routes to be considered also makes it impossible to assess the project's environmental impacts at this time.

In June 2012, Clean Line signed an agreement with the Western Area Power Administration (WAPA) to formalize roles and responsibilities for the project's environmental review under NEPA. The agreement also lays the groundwork for Clean Line and WAPA to secure financing for Centennial West under WAPA's Transmission Infrastructure Program.[20]

Southline

Southline Transmission Project is a proposed 360-mile, 345 kV and 230 kV merchant line

linking substations near Afton, New Mexico, and Marana, Arizona.[21]

This project would be divided into two sections. Approximately 240 miles of a new 345 kV line would be built between the Afton substation in New Mexico and the Apache substation in Arizona. Another 120 miles would consist of upgrades to existing lines between the Apache substation and the Tucson area. By improving existing transmission lines and locating new lines in corridors with existing infrastructure, Southline is attempting to minimize environmental impacts associated with upgrading the area's transmission infrastructure.

Compared to SunZia, Southline seeks to address similar needs: both aim to respond to increased growth in energy demands, ensure the grid's reliability, relieve congestion, and enhance renewable and conventional energy generation. But there are important differences.

The size of the proposed new and upgraded lines for Southline would provide between 1,000 and 1,500 MW of additional transmission capacity, less than the 3,000 to 4,500 MW estimated for SunZia. Also, because Southline's enhancements extend only slightly north of Tucson and not to end points that have access to transmission lines shipping power to California, Southline's primary beneficiaries are likely to be Arizona utilities and their customers.

Proposed routes being considered by SunZia and Southline parallel each other from Deming, New Mexico, to Benson, Arizona. Hence, both lines could spur development of similar renewable and conventional energy resources in southwestern New Mexico and southeastern Arizona.

A primary difference between the two lines is the environmental impact of the routes currently being considered. Both the BLM's preferred route for SunZia and the project proponent's preferred route transit environmentally sensitive areas and imply significant impacts. Southline's approach, by siting new lines along routes with existing infrastructure and upgrading existing lines, may result in significantly less disturbance of environmentally sensitive areas and fewer environmental impacts.

Southline is undergoing a NEPA environmental review process. The BLM and WAPA are co-lead agencies in this process. The initial public scoping process to identify issues and concerns closed in June 2012. A DEIS is expected in the summer or fall of 2013.

Summing Up

Clearly, the proponents of all three projects see a market opportunity to offer transmission service to future renewable energy generation facilities in New Mexico (and, to a lesser extent, Arizona). It is unlikely that the current market would support the simultaneous development of all three projects. In fact, each project presents a specific set of merits and challenges and offers differing approaches to addressing the need for additional renewable energy generation and transmission. Over the next five years or more, one project may find itself better positioned than the others to proceed given the current market and policy conditions. At the same time, any number of factors—financial, economic, or environmental (to name a few)—could derail any of these three projects.

The three sections that follow provide more detailed information about the market opportunity SunZia seeks to exploit.

Will SunZia Enhance the Reliability of the Grid System?

Project proponents and the BLM note that SunZia would meet a need for additional transmission lines, both to increase grid reliability and to relieve congestion.

Reliability and Congestion in the Southwest

As a general proposition, grid reliability and congestion are a national concern, primarily due to lagging investments in transmission infrastructure. The North American Electricity Reliability Corporation (NERC) found that transmission construction has been flat for the past two decades but is expected to increase during the next decade. Transmission lines greater than 100 kV are expected to expand from 372,340 circuit miles in 2009 to 406,730 circuit miles in 2019.[22] Half the projects are expected to maintain or improve reliability. A quarter of the projects will integrate renewable energy resources.[23] The average project length is less than 70 miles, which means that most of the projected lines will be for intrastate transmission.

Over the past decade, significant resources have gone into analyzing and identifying solutions to electric congestion issues across the United States. This includes U.S. Department of Energy—led efforts mandated by the 2005 Energy Policy Act to evaluate congestion issues nationwide. Reports were produced in 2006 and 2009, and the 2012 National Electric Transmission Congestion Study report is currently under way.[24] Repeatedly these studies have noted that portions of the grid system in the southwest region are among the most heavily used in the Western grid system and many experience seasonal congestion.[25]

The 2006 National Electric Transmission Congestion Study identified critical congestion issues in southern California and in and around Phoenix and Tucson, Arizona. Investments in several major transmission and grid upgrade projects in Arizona and southern California have helped to relieve many aspects of the situation. Input provided in preparation for the 2012 study indicates that, from the Arizona utilities' standpoint, there are no significant congestion issues not being addressed through existing and permitted transmission projects.[26] Nor did biennial transmission planning reports prepared in 2010 by Arizona-based utilities and submitted to the Arizona Corporation Commission identify congestion and reliability issues, either in the SunZia corridor or for meeting demand in the greater Phoenix and Tucson markets.[27] More recent reliability analyses, done in preparation for the 2012 biennial transmission report, appear to reach similar conclusions.[28]

A review of the Integrated Resource Plans (IRPs) for Arizona and New Mexico utilities indicates that they are prepared to address any constraints to load growth in their service territories through in-state transmission upgrades (APS,[29] PNM,[30] SRP,[31] and TEP[32]).

Yet, a 2009 update of the DOE congestion study also referred to a number of transmission corridors that had been identified in 2006 as congested and remained so in 2009.[33] These included Path 47, which refers to the power flows over a cluster of 115 to 345 kV lines in southern New Mexico and Arizona. Engineering studies have established that the addition of SunZia would substantially increase power transfer capability over Path 47, offering potential solutions to seasonal congestion.[34] SunZia's

engineers have worked with and will continue to work with grid operators in the project corridor to plan interconnections that will maximize the resulting reliability benefits for different portions of the existing electricity grid in New Mexico and in Arizona.[35]

The 2009 DOE study also identified "conditionally constrained" renewable resources—e.g., major geographic regions rich in renewable energy resources that could not be developed without the addition of new transmission capacity. This included wind, solar, and geothermal resources in New Mexico and Arizona, including the central New Mexico wind pocket targeted by SunZia.[36] The reason for this constraint is the simple fact that the existing grid system was not designed to move large volumes of electricity east to west out of New Mexico (most of the power historically has been directed west to east toward load pockets in southern New Mexico and El Paso, Texas). While some limited transmission capacity is actually available on some segments of the grid, what service is available would be insufficient for the purposes of any large-scale renewable energy development for a number of reasons.[37]

Taken together, the evidence indicates that SunZia responds to a real lack of adequate transmission capacity to move large amounts of new energy through southern New Mexico and Arizona. Because SunZia has been designed to interconnect with the existing grid, it necessarily provides some congestion relief to portions of the grid that historically have featured some of the West's heaviest patterns of use and related seasonal congestion. At the same time, load-growth forecasts dampened by the Great Recession; utilities' commitments to energy efficiency, demand response, and distributed generation; and smaller-scale transmission upgrades have worked to mitigate many of the problems associated with demand-driven congestion, reducing the acute near-term need for additional capacity (outside of what is needed to move new energy generation).[38]

Looking ahead a decade or more, this situation could change dramatically, particularly if the global economy recovers or if new federal or state policies stimulate greater demand for renewable energy. A prudent approach dictates that utilities prepare for such a scenario, which may explain why SRP, TEP, and Tri-State are investors in SunZia.

SunZia and Regional Reliability Planning

SunZia has participated in two planning efforts led by WECC, which is responsible for ensuring the overall reliability of the Western grid system.

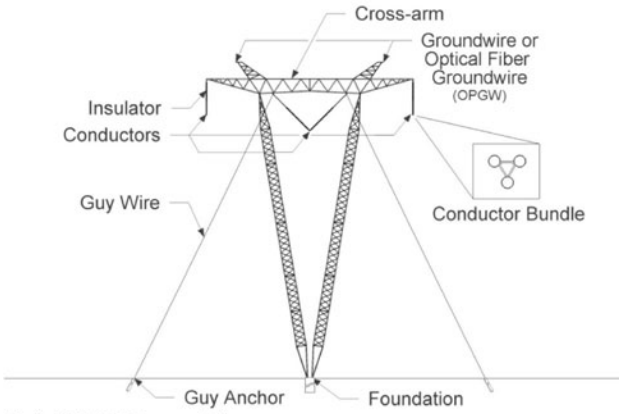
The first involves a path-rating process to determine SunZia's impact on grid reliability. This three-phase process considers the project's ability to (1) respond to an increased need for power transmission, (2) integrate with existing transmission systems, and (3) conform to a set of specific reliability standards given a range of possible conditions or scenarios. SunZia has completed this process and received an "Accepted Rating" as a 3,000 MW project consisting of two 500 kV lines, which provides some assurance that its capacity to deliver power would be maintained when future changes in the grid system are proposed.[39]

WECC also undertakes longer-term analyses of system reliability in order to predict how the grid will handle new power being developed and

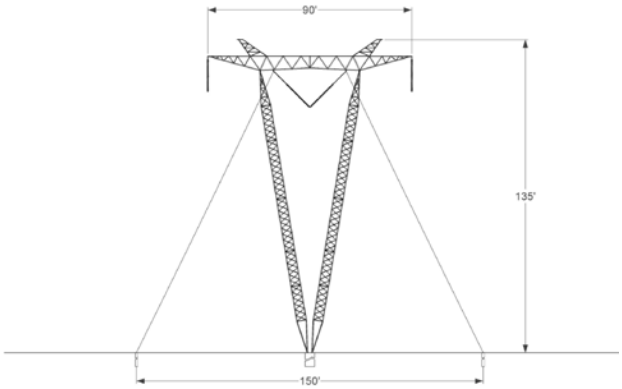
shipped to areas of growing demand. As part of these assessments, WECC conducts reviews of proposed transmission lines to determine which lines have a high probability of being in built within a ten-year time frame. These lines, or "foundational projects," are then included in the modeling or scenarios WECC creates as part of the long-term studies.[40]

Illustrative of the special challenges merchant lines face, SunZia was not selected as a foundational project. This decision was not a reflection of the project's ability to address system reliability concerns. Rather, it underscored that the criteria used in WECC's project selection favors traditional utility-driven transmission projects whose financial certainty is guaranteed by state regulatory agencies' existing cost allocation and recovery frameworks. SunZia argued that FERC's approved cost allocation met the criteria, but the project's developers did not prevail.[41]

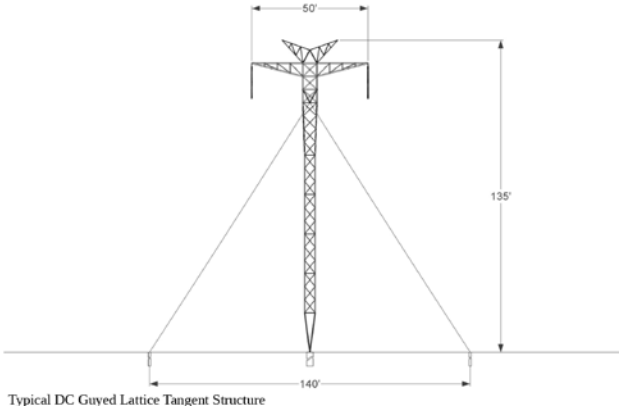
Figure 2
Typical Transmission Structures Considered for SunZia Project



Typical 500 kV Structure Diagram



Typical AC Guyed "V" Lattice Tangent Structure



Typical DC Guyed Lattice Tangent Structure

Source: BLM SunZia DEIS May 2012, chapter 2.

How Much Wind and Solar Can the Grid Absorb?

A concern raised by projects like SunZia that purport to deliver large amounts of renewable energy is whether the grid can absorb large amounts of wind and solar power. Having traditionally relied on large, controllable power plants, can the grid system keep the lights on by relying on wind farms and solar panels whose outputs fluctuate depending on the weather and time of day?

Grid operators are challenged by wind and solar generation for two reasons. First, these renewable resources are variable: their output fluctuates hourly, daily, and seasonally. Second, their future output cannot be predicted with accuracy. Consequently, some people feel that getting a majority of our power from wind and solar is unrealistic.

However, grid operators already deal with variability and uncertainty. Demand for power changes constantly, and sometimes drastically. All types of power plants have experienced failure or have been shut down for routine maintenance. The grid system has evolved to deal with the volatility of demand and supply, and one way it has done so is by diversifying its power sources.

The principle of diversity also applies to the challenge of integrating wind and solar into the grid. The power generated by these renewable resources can be made less variable by linking different types of wind and solar in different areas, through the grid, across a wide region.

The Electric Reliability Council of Texas (ERCOT), which manages the state's grid system, provides a good example of the potential for integrating renewable power. The Texas grid is not interconnected with those of its neighbors and operates on its own. In 2010, ERCOT generated more wind power than any other state: 8 percent of its electricity came from wind, surpassing its 2025 target. Less than 20 years ago ERCOT had no commercial wind generation.[42]

The Midwest Independent Transmission System Operator (MISO), which delivers electricity to 11 states, also has experienced significant growth in wind power. (Iowa and Illinois ranked second and third in installed wind capacity.) More than 6 percent of MISO's electricity comes from wind. With new grid management tools at its disposal and greater location diversity of wind resources, MISO does not forecast any significant operational or management challenges associated with wind.[43]

ERCOT has experienced some operational issues associated with wind but involving other factors,[44] including errors in forecasting demand and outages of conventional generators. With better forecasting and increasing experience managing wind resources, the ability of grid managers to cope with wind is expected to improve. At the same time, ERCOT operators have noted that a diversity of wind resources helps the grid to cope with periods of extreme peak demand.[45]

Ambitious goals for integrating wind, solar, and other renewables can be reached with existing, commercially available technologies. This would require changes in the way the grid is operated, as well as additional transmission infrastructure including new interstate lines.[46] Many of the required operational changes are being actively discussed, and in some instances they are already being implemented.[47]

What Type of Energy Will SunZia Carry?

It can be difficult for public stakeholders to ascertain the specific level and type of market demand for merchant transmission lines, especially those that extend beyond the boundaries of existing transmission service areas. Typically, new transmission investments by utilities prompt critical, public analysis of demand for the new service. In addition, there is a formal, internet-based system[48] that manages requests for transmission service on existing transmission networks; that system is a source of data on the demand for transmission service in existing utility service areas. In contrast, public data sources do not capture the detailed analyses of transmission demand that underpin the financial case for a merchant project, nor do public documents record ongoing contractual negotiations with potential anchor tenants, which are proprietary.

Lacking certainty about SunZia's customers, we can look at the proposed line's proximity to various energy resources to determine what types of new power generation facilities are likely to take advantage of transmission capacity provided by the project. In this section we discuss the quality of four proximate energy resources likely to access the SunZia line: solar, wind, natural gas, and coal.

However, it is worth noting that power generators not immediately proximate to the proposed line may also benefit from SunZia. By creating new transmission capacity, SunZia has the potential to increase transmission capacity on existing lines by drawing existing generation onto its lines, thus freeing up transmission access on the grid.

Renewable Energy

Given the high level of interest in SunZia's potential to transmit renewable energy, we begin with a discussion of regional assessments that have sought to identify high-quality solar and wind resources in the West, focusing on what they tell us about those resources closest to SunZia's area of service.

The National Renewable Energy Laboratory (NREL) is a federal research agency that conducts a range of studies and analyses designed to advance the understanding and application of renewable energy technologies. Among the resources NREL provides are maps and GIS data on the quality of renewable energy resources across the nation. These often serve as a primary source of information for regional studies of high-value and low-conflict renewable energy resources.[49]

In 2009, the Western Governors Association (WGA) released the results of a multistate initiative to identify the areas richest in renewable resources and best suited for development. These areas, known as Western Renewable Energy Zones (WREZs), meet certain minimum quality thresholds for solar, wind, hydropower, and geothermal resources, and exclude certain areas for environmental or technical reasons. The WREZ assessment represents the most comprehensive assessment of renewable resources in the West conducted to date.[50]

Solar

Arizona, New Mexico, Nevada, and southern California lead the nation in solar energy potential according to detailed measurements of solar radiation developed by NREL. All four states are well suited for development of photovoltaic and thermal solar resources.[51]

The WREZ assessment released by the WGA identified two areas of high solar energy potential in close proximity to the proposed SunZia route, including one in southwestern New Mexico and one that extends from southwestern New Mexico into southeastern Arizona. Efforts by the WGA to tally the generation capacity of these areas put the potential capacity at a little over 10,000 MW.[52]

In addition to the WREZ initiative by the WGA, the BLM has conducted a six-state environmental assessment to identify areas that are suitable for large-scale solar generation. Seventeen Solar Energy Zones (SEZs) have been selected, including two in Arizona and one in New Mexico. These SEZs are considered to have high-quality solar resources and are located in relatively low-conflict areas. The BLM is expected to provide a suite of incentives to encourage solar developers to site their projects within SEZs.[53] Because these efforts have resulted in prioritization of development in other areas, they have had the effect of downsizing the predicted amount of near-term solar development on public lands in the area that would be served by SunZia.

At its southern end in New Mexico, the proposed route for the SunZia line does pass near the Afton SEZ on BLM lands. According to the agency analysis, full development of the Afton SEZ could yield between 2,663 MW and 4,794 MW of solar electric power capacity. While an existing 345 kV line passes through the Afton zone, that line could not accommodate all of the potential generation capacity in the area.[54]

The Arizona Office of the BLM is conducting a statewide assessment—the Restoration Design Energy Project (RDEP)—to identify other low-conflict areas for solar (and wind) development on BLM, state trust, and private lands. The BLM has tentatively identified more than 5,000 acres of BLM, state trust, and private lands in Graham County, along U.S. Route 191, that qualify as low-conflict areas.[55]

Wind

In the desert Southwest, NREL has identified high-quality wind resources in central and eastern New Mexico. The originating substation in the proposed SunZia line is located in northern Lincoln County near the Guadalupe County line. This puts it in close proximity to a cluster of windy areas in Guadalupe, Torrance, and Lincoln counties that feature Class 4 or better quality wind resources. (These wind power classifications are a measure of wind speed and power used to assess development potential. Utility-scale developments typically demand wind resources that are Class 4 or better.[56])

Building on NREL's wind data, the WGA's WREZ initiative identified more than 11,000 MW of potential wind capacity, and the New Mexico Renewable Energy Transmission Authority has estimated a similar volume.[57] There are two operational wind farms in Guadalupe County. The 100 MW capacity High Lonesome project exports wind-generated electricity to Arizona under a 30-year power purchase agreement with

Arizona Public Service.[58] The 90 MW capacity Argonne Mesa project also sells power to Arizona Public Service under a 20-year power purchase agreement.[59]

New Mexico has the potential to produce many times its own electric consumption, which puts it in a position to export wind power. The closest markets to acquire these wind resources are in Colorado, but that state has similar wind resources that it is seeking to develop and possibly export, which means that New Mexico would likely look to Arizona and California for significant export markets. Given the high quality of the state's wind resources, the steady drop in the cost of wind power production, and the freedom it affords from volatile "fuel" costs, New Mexico wind may become attractive as an export resource despite the near-term challenges presented by low natural gas prices.

With regard to potential concerns about increased reliance on renewable energy resources, greater geographic or locational diversity of these resources reduces their variability. That is, the more widespread a utility's wind and solar resources are, the greater is the likelihood that some of those resources will be operating at full capacity when others are not. This reduces the risk of large fluctuations in power being delivered to the utility. Such diversity of resource types also provides significant efficiencies and cost savings, particularly for a utility whose portfolio includes a large share of variable resources such as wind.[60] See sidebar, page 13.

The federally funded Regional Transmission Expansion Program is exploring the cost-effectiveness of accessing remote renewables. Various scenarios representing aggressive additions of remote wind to meet California-driven demand for renewables are being evaluated. These modeling runs suggest that using remote wind farms, even with their increased transmission costs, can be more cost-effective than building new wind generators in California. These results depend heavily on assumptions about wind capacity factors and project development costs.[61]

Fossil Fuels

Natural Gas

New Mexico is a major exporter of natural gas. The San Juan Basin in the northwestern corner of the state witnessed extensive development of coal bed methane in the 2000s. Closer to SunZia, the Permian Basin, located in western Texas and in the southeastern corner of New Mexico, is a longtime oil and gas producing region, which has recently experienced a major uptick in drilling activity driven by high oil prices. Permian Basin oil and gas resources move to market through a large interstate pipeline network for export to hubs in California, New Mexico, and Arizona as well as points north and east.[62]

The United States is currently oversupplied in natural gas, resulting in low prices and a corresponding interest among utilities in using natural gas for power generation. Arizona added more than 12,000 MW of gas-fired generation capacity during the decade 2000–2010, and New Mexico about 2,200 MW. These and other additions in construction contribute to robust capacity throughout the region for gas-fired generation. Near-term plans for Arizona's large utilities and New Mexico's major utility are focused

heavily on natural gas generation.[63] However, whether and to what extent these plans are realized will depend on various factors, including the timing and scale of an anticipated economic recovery, future efforts to reduce greenhouse gas emissions and the use of carbon-based fuels, coal plant retirements, and the inherent volatility of natural gas prices.

There is no immediate evidence to suggest that SunZia's construction would be particularly advantageous in moving power from new gas-fired power plants to markets, especially compared to other options. Connection of those plants to Arizona load centers—where future demand is likely to grow as the economy recovers—could probably be accomplished more cost-effectively with in-state transmission than with a large interstate line. In contrast, renewable generation facilities distant from load centers (such as wind farms in central New Mexico) cannot be developed without new transmission access and capacity.

What Is the Relationship Between SunZia and the Bowie Power Plant?

There has been considerable public discussion concerning the project developer's intent in proposing SunZia. The evolution of the project and the developer's association with the Bowie Power Station, a 1,000 MW, fully permitted gas plant, have raised concerns about whether SunZia can truly be called a renewable energy transmission line. With regard to the project's changing rationale, the shift could be attributed to the project developer's recognition of the rapidly changing markets and policies favoring renewable energy development. Indeed, SunZia's inclusion of renewable energy development considerations may reflect just what federal and state policies were intended to do—encourage energy developers and transmission line proponents to integrate such considerations into their plans.

The Bowie gas plant can go forward without SunZia being built, and delays in building the gas plant have nothing to do with transmission access. Rather, the current low cost of natural gas and the available unused capacity of existing natural gas plants will keep utilities from paying a higher price for natural gas from a newly constructed plant. The Bowie plant was approved by the Arizona Corporation Commission in 2002, allowing for four natural gas turbines to be built along with a 345 kV generator tie line to interconnect with an existing 345 kV Tucson Electric Power line.[64]

The Bowie gas plant could bid on capacity in SunZia's open-access process. With regard to anchor tenant capacity, FERC will only allow Bowie to enter into a long-term transmission agreement with Shell WindEnergy, as a non-affiliated investor.[65] Shell WindEnergy claims just 37.5 MW of capacity for marketing to anchor tenants (of an initial 1,500 MW line). Moreover, FERC will authorize such an agreement only after ensuring that the terms of the agreement do not provide for any preferential treatment.

By itself, the Bowie gas plant is not likely to generate sufficient revenues to recover the cost of building a transmission line. As a result, the SunZia project investors will require additional participation for the SunZia project to be financially successful.

It should be noted that by freeing up capacity on existing lines, SunZia would likely have the effect of increasing transmission service options for all shippers. The added capacity on the market could encourage competition for new transmission service contracts. So it is reasonable to predict that natural gas generators and their customers are likely to benefit from SunZia's entry into the market; however, this is not the same as concluding that SunZia will lead to growth in natural gas generation facilities.

Coal

There is no evidence to suggest that SunZia either depends on or benefits existing or future coal-fired generation facilities. Active coal mines in Arizona and New Mexico are in northwestern New Mexico's San Juan Basin and in northeastern Arizona at Black Mesa. Coal-fired power plants in New Mexico are mostly centered around the San Juan Basin, while Arizona has two plants near the SunZia corridor.These power plants are established and do not require new transmission.

More important, the current policy environment poses major obstacles for coal generation going forward. Existing federal air quality regulations create cost challenges for retrofitting coal plants, and these have been amplified by low natural gas prices. Oregon, Nevada, and Colorado are all actively engaged in retiring coal facilities, in some cases ahead of schedule (in terms of the plant's original design). Pacificorp recently announced it is considering converting one unit in a coal-burning power plant in Kemmerer, Wyoming, to natural gas for cost reasons.[66]

Energy-importing states including California, Oregon, and Washington all have carbon standards associated with any new long-term purchases of power from resources within or imported into state borders. By requiring the emissions level to be equal to or less than a combined-cycle natural gas combustion turbine, these policies effectively prohibit any new purchases of energy from coal generators.[67] In addition, in March 2012, the Environmental Protection Administration proposed nationwide emissions standards (New Source Performance Standards) that set ceilings for carbon dioxide emissions for new fossil fuel electric plants. Coal plants would not be able to meet those standards cost-competitively with existing technologies.[68]

A question posed by the probable future of the region's coal plants is whether coal-plant retirement would liberate the transmission capacity necessary to add new renewable energy generation to the grid. Key variables affecting this possibility are the likely dates of plant retirements and whether the available transmission capacity post-retirement would suit the needs of renewable generators in terms of geography, cost, and market access. Such analysis goes beyond the scope of this report but is a subject of ongoing modeling efforts by regional planners at WECC.[69]

Will SunZia Help New Mexico, Arizona, and California Meet Renewable Energy Quotas?

SunZia's alignment, which targets pockets of high-value renewable energy resources, reflects market and policy trends in the Southwest and the entire Western grid system. Support for the expansion of renewable energy generation comes in the form of state mandates, such as Renewable Portfolio Standards (RPS), which specify that some increasing portion of a state's total electric energy use must come from renewable energy sources.

Considerable debate exists about where states will acquire the renewable energy to meet quotas—in particular, how much renewable energy will come from in-state, including distributed generation, versus out-of-state generation facilities. Because of economic benefits such as jobs and tax revenue associated with the construction of generation facilities, states have strong incentives to focus on in-state generation facilities. However, states vary in their ability to meet renewable energy quotas with in-state generation.[70]

California, Oregon, Washington, Montana, Nevada, Colorado, Arizona, and New Mexico all have RPS, and Utah has a "renewable and alternative energy goal." Taken together, these quotas create a strong demand for new renewable generation. The most recent projections from WECC show that to meet existing RPS requirements, the Western grid system will need to add 79,937 GWh of new renewable generation between 2011 and 2022. Such an addition would roughly double the amount of renewable energy generated (65,539 GWh in 2010) over the course of just 10 years.[71]

Wind has been the cornerstone resource in RPS compliance nationwide and in the West to date. A 2010 study by Lawrence Berkeley National Laboratory modeling potential procurement scenarios in the West identified wind as the largest source of renewable energy under a variety of scenarios.[72] WECC estimates that half the RPS demand will be fulfilled by wind in 2022.[73] The significant decrease in the cost of solar photovoltaic equipment over the past few years has lead to projections that increasingly favor greater volumes of solar in the mix for state RPS procurement, especially in California and the Southwest.[74]

Two forces determine the relationship between RPS implementation and where renewable energy generation is developed. First, utilities, compelled by law to comply with their state's RPS within certain time frames, seek renewable energy contracts that satisfy their obligations under state law, avoid risk as much as possible, and are cost competitive. Second, renewable energy developers seeking contracts with those utilities have to surmount the logistical challenges of financing, permitting, and obtaining transmission access for new renewable energy facilities at costs and within time frames that are competitive with products offered from other states. These challenges are significant. A common expectation is that contracted generation projects will experience a 30 to 40 percent failure rate.[75]

The following discussion evaluates the RPS-driven market in New Mexico, Arizona, and California and opportunities and challenges for customers of transmission on the proposed SunZia project.

New Mexico

With its small population, New Mexico is not a major consumer of electricity compared to Arizona and California. Load growth is expected to be relatively modest in the near future. The state's Renewable Portfolio Standard commits investor-owned utilities to a 20 percent renewable quota by 2020 and rural electric cooperatives to 10 percent by 2020. For investor-owned utilities, which deliver the majority share of electric service in the state, there are technology minimums: 20 percent of the RPS must be met with solar power, 20 percent with wind power, and 10 percent from either biomass, geothermal, hydropower (with a post-2007 in-service date), or other renewables. The RPS law also commits utilities to meeting 3 percent of the renewable quota with distributed energy. A state energy-efficiency resource standard also aims to curtail load growth with mandated sales reductions based on improved energy efficiency.

Information from state and utility plans, compiled by the WECC in a recent effort to inform its "base case" model for future resource mixes and volumes for each state in 2022, suggests that New Mexico investor-owned utilities and co-ops will acquire roughly 584 MW of new renewable energy generation capacity, above what is already planned, to accomplish RPS compliance by 2022. The renewable resources could take a variety of forms, but the mix is forecast to include about 75 percent wind. This suggests that while SunZia is not a driver in helping New Mexico achieve its RPS, it could provide a transmission alternative that assists in meeting the state's goal.

Arizona

Arizona has some of the best solar resources in the nation. Its competitive advantage in developing those resources lies in their close proximity to load centers (Phoenix-Tucson, Las Vegas, and markets in southern California). Compared to Nevada and southern California, Arizona has a more diverse portfolio of land suited for development of large-scale solar projects. It also has a less stringent set of state environmental regulations than California. All these factors could facilitate development of its solar resources for export.

The state lacks any comprehensive energy policy or plan that signals to the solar and utility industries, the investment community, and developers the state's intent to support and develop a significant market for solar energy in Arizona. It was one of the first states to adopt an RPS: the standard adopted in 2006 requires regulated utilities to generate 15 percent of their energy from renewable resources by 2025. As of 2011, the state's two largest regulated utilities, APS and TEP, are meeting or exceeding their compliance requirements.[76] According to Vote Solar, SRP (a customer-owned, non-regulated utility) will meet 6.8 percent of its total retail sales with non-hydro renewable resources by 2020. This figure is less than the requirement for regulated utilities, which are required to reach 10 percent by 2020.[77]

A review of Arizona's three major utilities' Integrated Resource Plans (IRP) indicates that most of their energy needs will be met with in-state resources. APS forecasts an increased reliance on natural gas, renewable energy, and energy efficiency. While its IRP does not clearly

specify the type of renewable energy, the list of near-term large-scale projects in the APS action plan indicates a primary reliance on solar.[78] SRP forecasts an increased reliance on natural gas, short-term purchases, demand-side resources, and renewables. The latter includes 450 MW of new wind, solar, geothermal, and distributed resources by 2019.[79] TEP forecasts an increased reliance on energy efficiency and renewable resources (utility- and distributed-scale), with an emphasis on in-state solar resources. As a percentage of its portfolio, TEP's reliance on gas decreases slightly, but the utility maintains an overwhelming (more than 64 percent) reliance on coal.[80] As in New Mexico, these forecasts suggest that SunZia, while not essential, could provide a transmission alternative that helps Arizona meet its RPS.

California

California's approach to procuring renewable energy attracts close attention because the volume of energy demand in California, coupled with its high (33 percent) RPS, makes that state the largest market for renewable energy in the West by a large margin.[81] California is responsible for roughly 60 percent of the projected growth in renewable resource generation over the next 10 years, according to WECC's recent tallies.[82] An analysis in 2009 by the California Public Utilities Commission found that implementation of the 33 percent renewable standard would require the procurement of 75 terawatt hours of new renewable energy by 2020—in addition to (that is, roughly tripling) the 27 TWh in place at the end of 2007.[83]

California has had remarkable success in achieving RPS targets to date, and long-term contracts for utility-scale wind facilities in California—but also in Oregon, Washington, Wyoming, and Montana—have played a role in the ability of investor-owned utilities, which deliver about three-quarters of California's power, and some customer-owned utilities, to meet these standards.[84] In fact, in the 2009 analysis of pathways to achieving a 33 percent RPS by 2020, the California Public Utilities Commission found that a scenario relying heavily on wind and geothermal resources delivered from out of state would be more feasible on a cost and logistical basis.[85]

Despite these findings, in implementing the 33 percent RPS, California policy makers placed a high priority on using in-state generation to meet renewable generation demand.[86] The recent (December 2011) decision[87] regarding procurement rules prescribes three "portfolio content categories" (sometimes called buckets) that are distinguished by where energy is generated and how it is delivered to California. Subsequent rule-making established a calendar for meeting these quotas going forward and tackled a number of technical aspects of the law.

Of importance to energy generators in New Mexico and Arizona, beginning in 2017 it will be required that 75 percent of the contracts for renewable energy deliver both energy and renewable energy credits either through direct interconnection with the California grid or by grid operation strategies that simulate direct interconnection.[88]

One of SunZia's potential competitive advantages is that generators utilizing the line could conceivably compete for power purchase agreements in California's first-priority category

based on deliverability under the RPS categories. The project developers express confidence that this will be the case.[89] Still, the technical aspects of grid operations and related policy pose significant hurdles to out-of-state generation facilities (and the energy they produce) trying to qualify for this status.[90]

It is possible to design transmission contracts to achieve the basic deliverability requirements of California's RPS procurement rules. For example, the purchasing California utility could take ownership of power moved on SunZia at a point of interconnection within a California Balancing Authority.[91] Ultimately there are contractual, as well as technical, hurdles to overcome to meet California's deliverability requirements.[92]

Significant changes in the framework and implementation the California RPS have transpired since the planning process for SunZia began, and more changes may come into play before the project, if built, is energized. The enormous logistical and economic challenges associated with an "all California" approach to renewable generation procurement may prompt lawmakers to consider reforms. Clearly, project developers like the SunZia group and the generators they plan to serve will do everything in their power to move policies—and the technical interpretation of them—in their own favor. These developments are an excellent illustration of the many complex policy issues affecting the remote markets for renewable resources located in resource-rich states like New Mexico. Not only are such factors beyond the grasp of project developers; they also make it very difficult to assess definitively the market potential for remote renewables over a five or ten-year time frame.

Source: SunZia presentation 11/18/11.

Key Points and Conclusion

Key Points

The proposed SunZia transmission project is a major industrial project that would expand the transmission infrastructure in New Mexico and Arizona. If built, the project would have significant impacts on communities and landscapes. For this reason, a deeper understanding of the rationale for new high voltage transmission line(s) is a key concern for many stakeholders and decision makers weighing the costs and benefits of the SunZia transmission line project. This report has described the market and policy factors affecting the demand for the proposed transmission service. In evaluating SunZia's merits and assessing them relative to impacts, the following four key considerations outlined in this report are useful:

The Merchant Transmission Development Model: Merchant developments such as SunZia face greater start-up challenges than those developed by regulated utilities. SunZia will not proceed to construction without commitment from customers for transmission service.

The business model for merchant transmission projects is predicated on a demand for transmission capacity that is not being met by incumbent utilities. SunZia is not alone in identifying a market opportunity to export New Mexico wind and other new generation resources.

While merchant project developers can seize on opportunities to serve transmission demand in areas beyond the prescribed service areas of utilities, they cannot rely on guaranteed cost recovery from ratepayers (as utilities can). Unlike lines proposed by utilities, which may not reach full utilization for many years after they are first energized, merchant lines must recruit enough customers to fully utilize the line or the line will not be built. Market factors must be properly aligned to allow merchant lines to proceed.

Reliability and Congestion on the Electric Grid: SunZia's fundamental rationale is to add capacity to a grid that currently cannot accommodate large amounts of new energy generation in central New Mexico and southern Arizona. The project also creates opportunities to improve reliability and relieve congestion within a historically congested corridor.

SunZia responds to a real lack of adequate transmission capacity to move large amounts of new energy through southern New Mexico and Arizona. Because SunZia has been designed to interconnect with the existing grid, it would provide reliability benefits and opportunities for congestion relief. In the past few years, a number of factors, particularly reduced demand, have worked to mitigate many of the acute problems associated with demand-driven congestion throughout much of SunZia's corridor. However, looking ahead, this situation could change dramatically as a function of economic recovery and increased demand for generation resources driven by economics, policy, or both. A prudent approach dictates preparing for such a scenario and a possible role for transmission expansion in it.

New Generation and Transmission Demand: ***SunZia could facilitate development of a high-quality wind resource in central New Mexico. In fact, as proposed, SunZia depends on the success of developing these and other new renewable energy resources. Natural gas generation will grow as the New Mexico and Arizona economies recover, but these facilities would not be predicated on SunZia's construction.***

The future energy market is very hard to predict and will be shaped by many factors: the pace of the economic recovery; consolidation, innovation, and cost reductions with wind and solar industries; retirement of aging coal plants; trends in natural gas prices; the viability of the merchant transmission line business model; and changes in policies that incentivize demand for production of renewable energy.

The origin of SunZia in east-central New Mexico targets a significant cluster of wind resources that are Class 4 or better. The amount of developable wind power in Guadalupe, Torrance, and Lincoln counties has been estimated in preliminary studies at over 11,000 megawatts. While relatively little detailed analysis is publicly available about the feasibility of developing large wind farms in this area, there are operational wind farms in the area and high development potential in terms of the quality of the wind resource.

Arizona and New Mexico's public utilities plan to meet a large part of future load growth with new natural gas generation. Plans for expanded natural gas generation and interconnection to the grid do not depend on SunZia. If built, SunZia will become a major feature in the bulk electricity grid and may attract transmission contracts from a variety of energy types. The presence of the line could even affect the location of future natural gas generation facilities. However, the build-out of natural gas facilities, including the Bowie gas plant, will occur based on the pace and scale of economic growth in the region and policies affecting energy markets. Simply stated, there are cheaper ways to bring additional natural gas resources to markets, particularly in Arizona, than through SunZia.

There is some overlap among SunZia, Centennial West, and Southline in terms of potential wind and solar resources to be developed and markets to be accessed. However, prioritizing which project is "better" solely from a renewable energy generation standpoint is problematic. Many overlapping, but distinct, factors will influence each project's likelihood of success.

Renewable Portfolio Standards Markets: The SunZia transmission project, as currently proposed, depends on market opportunities to export New Mexico wind resources to Arizona and California (and, to a lesser extent, solar resources). The quality of these market opportunities has diminished since the project was initially conceived. However, state Renewable Portfolio Standards (RPS) and federal energy policies have been dynamic and are likely to undergo further changes in the next phases of SunZia's development.

Meeting existing state policy mandates for new renewable generation over the next decade across the Western grid system will require a significant addition of new generation facilities, more than

double what has been built to date. Many states, including Arizona and New Mexico, have plans to meet mandated renewable generation quotas with in-state resources that do not specifically indicate a need for an interstate transmission line. However, California's large energy demands and aggressive RPS standard are a market opportunity for which wind and solar energy delivered by SunZia could potentially compete.

The scope of the California market opportunity depends heavily on the resolution of technical questions regarding whether resources delivered over SunZia would qualify for a priority position under the state's RPS implementation plan. SunZia's developers are confident this is possible, but the policies are new, the details complicated, and a definitive assessment will only be possible once specific power purchase agreements are negotiated. Looking forward, it is conceivable that under different market trends scenarios (e.g., a return of high natural gas prices) renewable energy could be cost competitive and appealing to power purchasers on its own merits, outside of RPS mandates.

Conclusion

Based on these considerations, this report concludes that the financial viability of the SunZia transmission project, as currently proposed, is dependent on the ability of potential customers of transmission service on SunZia (generators) to exploit market opportunities to export New Mexico wind resources to Arizona and California (and, to a lesser extent, solar resources). This value proposition drives not only SunZia, but also the Centennial West and Southline transmission line proposals. As noted above, there are significant hurdles to be overcome in order to take advantage of these opportunities. Whether enough factors will align to make the SunZia project viable remains to be seen.

Given the highly fluid operating environment governing energy markets, these considerations could change. For those who care about what kind of power gets shipped along lines proposed by SunZia, or the Centennial West and Southline projects, what matters most is the promotion, adoption, and effective implementation of policies that clarify energy markets. Examples include renewable portfolio standards at the state and federal level, state and federal policies addressing the dangers of greenhouse gas pollution, as well as incentives like tax credits and other investments in different parts of the energy sectors. These policies are ultimately what create the certainty that many stakeholders seek about which energy resources will benefit from individual transmission line proposals.

Notes

[1] Bureau of Land Management, 2012, SunZia Project Development Timeline, http://www.blm.gov/nm/st/en/prog/more/lands_realty/sunzia_southwest_transmission/schedule.html.

[2] Bureau of Land Management, Draft Environmental Impact Statement and Resource Management Plan Amendments, 2012, pp. I-5-I-6.

[3] Western Electricity Coordinating Council (WECC), 2007, WECC Regional Planning Project Report: SunZia Southwest Transmission Planning Report, http://www.wecc.biz/committees/StandingCommittees/PCC/TSS/Shared%20Documents/Projects%20Undergoing%20Regional%20Planning%20Rating%20Review/SunZia%20Southwest%20Transmission%20Project/SunZiaRPPR_Final_051507.pdf.

[4] "SATS Update," SunZia Southwest, July 17, 2008 (not available online).

[5] This is based on the Western Governors Association's Western Renewable Energy Zones study, which identified about 11,348 MW of developable wind resources in areas proximate to the SunZia line. Western Governors Association, 2009, Western Renewable Energy Zones Phase 1 Report, http://www.westgov.org/wga/publicat/WREZ09.pdf.

[6] MMR acquired ECP SunZia in 2010.

[7] Stanford Graduate School of Business, "Solar Power's Bright Future: A Conversation with Stefan Reichelstein on the Economics of Solar Power," June 6, 2012, http://www.gsb.stanford.edu/news/headlines/Reichelstein-solar-2012.html. Wiser et al. 2011, "2010 Wind Technologies Market Report," National Renewable Energy Laboratory, http://www.nrel.gov/docs/fy11osti/51783.pdf.

[8] U.S. Energy Information Administration, Annual Energy Outlook 2012 with Projections to 2035, June 2012, p. 87.

[9] WestConnect is a regional planning entity composed of utility companies providing transmission of electricity in Northern California, Nevada, New Mexico, Arizona, Colorado, and Wyoming; the Western Electricity Coordinating Council (WECC) coordinates reliability as well as planning activities in the entire Western grid system (service territory extends from Canada to Mexico and includes the provinces of Alberta and British Columbia, the northern portion of Baja California, Mexico, and all or portions of the 14 Western states between).

[10] Executive Office of the President, Council on Environmental Quality. Press Release, October 5, 2011, http://www.whitehouse.gov/administration/eop/ceq/Press_Releases/October_5_2011.

[11] See pages 2–3 for the current ownership of the SunZia project.

[12] Between 2009 and 2011, WECC reduced estimated loads in the region by about 5.5%, but allocated the share of those reductions disproportionately to major California service areas (Southern California Edison's reduction was 35% of the total reduction in the regional forecast, despite the area claiming only 10% of total load). Source, TEPPC 2009 Study Program Appendix, http://www.wecc.biz/library/StudyReport/Documents/Assumptions%20Matrix%20for%20the%202019%20TEPPC%20Dataset.pdf; and TEPPC 2011 Study Program "Matrix of Assumptions" appendix, http://www.wecc.biz/Lists/Calendar/Attachments/4084/2022_CommonCase_InputAssumptions.docx. Also, see page 11 for discussion of California's Renewable Portfolio Standard implementation strategy.

[13] "LS Power Transmission Line Could Be Completed by 2010," Business Las Vegas, Oct. 3–9, 2008. Accessed online, http://www.swipos.com/News/IBLV%2010.3.08%20LS%20Power%20transmission%20line%20could%20be%20completed%20by%202010.pdf.

[14] FERC, Order on Petition of Declaratory Order, 135 FERC ¶ 61,169 Docket EL-11-24. For more details on FERC's decision on SunZia, go to http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12664558.

[15] Silverstein, Alison, "Transmission 101", NCEP Transmission Technologies Workshop, April, 20–21, 2011, p. 13.

[16] For more information on Centennial West, go to http://www.centennialwestcleanline.com/site/home.

[17] Meah, Kala, and Sadrul Ula, "Comparative Evaluation of HVDC and HVAC Transmission Systems," IIEE Xplore, November 2008.

[18] Clean Line Energy Partners cited a target of 6 cents per kWh cost of delivered electricity in California in a webinar hosted by Transmission Hub on 7/31/2012.

[19] Western Governors Association and U.S. Department of Energy, 2009. Western Renewable Energy Zones: Phase 1 Report. http://www.westgov.org/component/joomdoc/doc_download/5-western-renewable-energy-zones--phase-1-report.

[20] See http://www.centennialwestcleanline.com/sites/centennial_west/media/docs/FINAL_Centennial_West_Press_Release_061812.pdf.

[21] For more information about Southline, go to http://www.southlinetransmissionproject.com, or http://www.blm.gov/nm/st/en/prog/more/lands_realty/southline_transmission.html.

[22] Silverstein, Alison, "Transmission 101", NCEP Transmission Technologies Workshop, April, 20–21, 2011, pp. 8–10.

[23] Ibid., p. 16.

[24] U.S. Department of Energy, 2006. National Electric Congestion Study, August, 2006. http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/Congestion_Study_2006-9MB.pdf. U.S. Department of Energy, 2009, National Electric Congestion Study, http://energy.gov/sites/prod/files/Congestion_Study_2009.pdf. For 2012 study, see: http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/transmission-planning/2012-national.

[25] It bears mentioning that among utility industry professionals, the metrics and implications of congestion are debated. It is not always the case that patterns of heavy use (i.e., "congestion") present reliability concerns. See, for example, Western Congestion Analysis Task Force, 2006, Western Interconnection 2006 Congestion Assessment Study, p. 50, http://nietc.anl.gov/documents/docs/DOE_Congestion_Study_2006_Western_Analysis.pdf.

[26] See presentations and transcript of the 2012 National Transmission Congestion Study workshop held on December 15, 2011, in San Diego, http://energy.gov/oe/downloads/2012-national-electric-transmission-congestion-study-san-diego-workshop.

[27] See the 6th Biennial Transmission Assessment at http://www.azcc.gov/Divisions/Utilities/Electric/Biennial/2010%20BTA/6th%20BTA%202010%20Staff%20Report%2012%2027%2010.pdf.

[28] See http://www.azcc.gov/Divisions/Utilities/Electric/BTA-Index.ASP.

[29] APS: http://www.aps.com/_files/various/ResourceAlt/2012ResourcePlan.pdf, see pp. 20–23.

[30] PNM: http://www.pnm.com/regulatory/pdf_electricity/irp_2011-2030.pdf, see pp. 63–72.

[31] SRP: http://www.srpnet.com/about/pdfx/ResourcePlanFY2011.pdf.

[32] TEP: http://files.shareholder.com/downloads/UNIS/2014411930x0x557199/806B57DB-06CF-4E46-BB16-124E53DCAC74/2012_TEP_IRP_1.pdf, see pp. 111–125.

[33] U.S. Department of Energy, National Electric Transmission Congestion Study 2009, December, 2009, p. 97.

[34] Evaluating the impacts of historical seasonal congestion on Path 47, and by extension evaluating the need for congestion relief, is beyond the scope of this report. Evidence of the attention to integration for the benefit of existing grid operators is provided by SunZia's successful completion of Phase 2 of the WECC Path Rating process, discussed on page 11.

[35] Robert Kondziolka, Salt River Project, personal communication, 10/11/2012.

[35] U.S. Department of Energy, National Electric Transmission Congestion Study 2009, December, 2009, p. 22.

[37] The reasons include the directionality of flows of available capacity, limited firm capacity, as well as the problem of "rate pancaking," e.g., having to pay tariffs and wheeling charges for transmission service over multiple segments of the grid under different ownerships. The project developer provided these comments on this topic:

> The majority of available capacity (e.g., 1,048 MW) over the existing configuration of Path 47 is along the Newman–West Mesa circuit (south-to-north flow) that itself is limited by operation of the phase-shifting transformer (PST) at Arroyo Substation near Las Cruces. The operation of this PST is set under the terms of a past arbitration between Public Service Company of New Mexico and El Paso Electric. We continue to believe that SunZia's wind generation customers at SunZia East Substation will want to schedule their deliveries west into Arizona to their utility customers at the Palo Verde Hub, and not into the metropolitan area of Albuquerque. Potential solar-PV generators in southwestern NM and southeastern AZ will likely share this same market objective.

Referring to ATC reports from El Paso Electric Company and PNM, he adds, "Thus it is easy to see that between these two transmission owners of the existing 345 kV system in southern NM that would be available to wheel renewables (wind and solar) west, the existing system is wholly inadequate." Tom Wray, personal communication, 9/24/2012. The reports referenced are: El Paso Electric Company, Determination of TTC/ATC April 2012; and Public Service Company of New Mexico (PNM), Determination and Posting Of Total Transfer Capability (TTC) and Available Transfer Capability (ATC) August 2012.

[38] The Draft EIS for SunZia does not evaluate the degree to which distributed generation, energy efficiency, demand-side management, or proposed line enhancements and additions may modify or shape congestion and reduce the need for new transmission lines like SunZia. Many stakeholders involved in reviewing proposed transmission lines believe that these "nonwire alternatives" should be discussed when considering the need for a proposed transmission project.

[39] The Western Electricity Coordinating Council (WECC) Peer Review Group, 2011. "SunZia Southwest Transmission Project WECC Accepted Path Rating Phase 2 Study Report, volume 1: Main Report," February 22, 2011.

[40] WECC's most recent completed study, a ten-year plan, is at http://www.wecc.biz/library/StudyReport/Wiki%20Pages/Home.aspx.

[41] WECC Subregional Planning Group, 2022 Common Case Transmission Assumptions, Final Draft, Appendix E, February 6, 2012.

[42] Amory B. Lovins and the Rocky Mountain Institute, Reinventing Fire: Bold Business Solutions for the New Energy Era, 2011, p. 187.

[43] See MISO's February 2012 Wind Update to the Markets Committee of the Board of Directors, https://www.midwestiso.org/Library/Repository/Meeting%20Material/Stakeholder/BOD/Markets%20Committee/2012/20120215/20120215%20Markets%20Committee%20of%20the%20BOD%20Item%2005%20Wind%20Update.pdf.

[44] Wan, Yih-Huei, "An Analysis of Wind Power Ramping Behavior in ERCOT," NREL-TP 5500-49218, March 2011.

[45] Newly installed coastal wind farms provided essential wind energy during periods of high demand during the hot summer of 2011 in Texas. The coastal wind farms netted energy in the afternoon, when demand was high, complementing other wind-farm resources elsewhere in the state with different daily patterns. "State Electric Grid Operator Says Outages Not Likely This Week," Austin Statesman online, August 9, 2011, http://www.statesman.com/news/news/state-regional/state-electric-grid-operator-says-outages-not-like/nRdLx/.

[46] National Renewable Energy Laboratory, Renewable Electricity Futures Study, 2012, vol. 1, pp. xvii–xviii.

[47] Western Governors' Association, Meeting Renewable Energy Targets in the West at Least Cost: The Integration Challenge, 2012.

[48] Specifically, the Open-Access Same-Time Information System, or OASIS. For a description see http://ww2.wapa.gov/sites/western/transmission/oasis/Pages/default.aspx.

[49] http://www.nrel.gov/gis/maps.html.

[50] For more information on the WGA's WREZ initiative, go to http://www.westgov.org/rtep/219.

[51]http://www.nrel.gov/gis/solar.html.

[52] See WREZ Phase I map, Western Renewable Energy Zones Initiative, Renewable Energy Generating Capacity Summary, http://www.westgov.org/rtep/219.

[53] For more information on the BLM's Solar PEIS, go to http://solareis.anl.gov.

[54] U.S. Bureau of Land Management, Final Solar PEIS, chapter 12.1.6.

[55] For more information on AZ BLM's Restoration Design Energy Project, go to http://www.blm.gov/az/st/en/prog/energy/arra_solar.html.

[56] For a description of the data influencing wind power class rankings, see http://www.nrel.gov/gis/data_analysis_background.html.

[57] Western Governors Association, 2009, Western Renewable Energy Zones Phase 1 Report, http://www.westgov.org/wga/publicat/WREZ09.pdf, and New Mexico Renewable Energy Transmission Authority, New Mexico Senate Memorial 44 (SM 44), sponsor, Sen. Timothy M. Keller, p. 18, http://nmreta.com/files/SM 44 Response Report 1.0 at 11-24-09 jm compressed.pdf.

[58] https://www.aps.com/files/_files/pdf/map/HighLonesome.pdf.

[59] http://www.aps.com/files/_files/pdf/map/Aragonne.pdf.

[60] Western Grid Group, Western Grid 2050: Contrasting Futures, Contrasting Fortunes, http://www.cleanenergyvision.org/wp-content/uploads/2011/08/WG2050_final_rev082211.pdf.

[61] TEPPC 2019 Study Report (PC 13), and TEPPC 2020 Study Report (PC 6 & 7).

[62] United States Energy Information Administration, n.d. Natural Gas Pipelines in the Southwest Region, http://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/southwest.html.

[63] For an overview of recent statements by the utilities, see "Natural Gas Key to Arizona Utilities," Arizona Republic, March 31, 2012, http://www.azcentral.com/business/articles/2012/03/29/20120329natural-gas-key-to-arizona-utilities.html. Utility Integrated Resource Plans can be found online. Specifically, see Arizona Public Service Company, 2012 Integrated Resource Plan Technical Conference, June 8, 2012, p. 24, http://www.aps.com/_files/various/ResourceAlt/2012IRPTechnicalConference.pdf; Public Service Company of New Mexico, Electric Integrated Resource Plan 2011–2030, July 2011, p. 6, http://www.swenergy.org/news/news/documents/file/PNM_IRP_2011-2030_July_2011.pdf; Salt River Project, 2011, FY2011 Resource Plan, August 2010, p. 5, http://www.srpnet.com/about/pdfx/ResourcePlanFY2011.pdf.

[64] Bowie Power Station, Bowie Power Station Update, 7th BTA Workshop No. 1, July 10, 2012, p. 5. Queries of TEP's OATI/OASIS systems (Open Access Technology International/Open Access Same-Time Information System) conducted on October 8, 2012, confirm that adequate Available Transmission Capacity exists today along TEP's existing Vail–Greenlee–Springerville–San Juan 345 kV system, much as it did when the Bowie project was originally approved by the Arizona Corporation Commission in 2002.

[65] FROM FERC ORDER at ii.b.i.25: Petitioner asserts that SW Power, ECP SunZia, and Shell WindEnergy each commits not to allocate any of its pre-subscribed share of the Project capacity (i.e., that share of capacity subject to anchor customer arrangements) to any of its own affiliates.

[66] Associated Press, "Kemmerer may convert Naughton unit to gas," April 19, 2012, http://www.kemmerergazette.com/v2_news_articles.php?heading=0&page=72&story_id=2991.

[67] In addition, Oregon's renewable resource portfolio standard requires any utility purchasing new coal energy to increase the percentage of renewable energy in its portfolio to 25%. A useful reference on state standards for renewable energy is the Database of State Incentives for Renewables and Efficiency (DSIRE), http://www.dsire.org.

[68] For a summary, see this news alert from the law firm Van Ness Feldman: http://www.vnf.com/news-alerts-696.html.

[69] Specifically, the Scenario Planning Steering Group. See http://www.wecc.biz/committees/BOD/TEPPC/SPSG/default.aspx.

[70] WECC's "2020 Expected Future" for the acquisition of RPS energy from in-state versus out-of-state sources points to Utah and Oregon as states likely to acquire more than 25% of their renewable energy from out-of-state sources. WECC 10-Year Regional Transmission Plan Summary, p. 23. State production and consumption data can be found via the U.S. Energy Information Administration's State Energy Data System, http://205.254.135.24/state/seds/.

[71] WECC, 2011, Common Case 2022 State-Adjusted Loads and RPS Requirements, Final Draft. http://www.wecc.biz/committees/BOD/TEPPC/20120106/Lists/Minutes/1/2022%20Renewables_FINAL_20120206.xlsx.

[72] A. Mills et al. 2010, "Exploration of Resource and Transmission Expansion Decisions in the Western Renewable Energy Zone Initiative," Lawrence Berkeley National Laboratory, February 2010, http://eetd.lbl.gov/ea/ems/reports/lbnl-3077e.pdf.

[73] WECC, WECC-TEPCC 2022 Common Case: Conventional and Renewable Resource Assumptions, http://www.wecc.biz/committees/BOD/TEPPC/20120106/Lists/Presentations/1/120210_2022CCGenerationAssumptions_RTEPWebinar.pdf.

[74] "Calif. Sees Solar Growth Spurt," E&E News, July 31, 2012, http://www.eenews.net/climatewire/2012/07/31/archive/1?terms=solar+california.

[75] CRPSC-SPSC webinar, California's Renewables Portfolio Standard, July 2012, http://www.westgov.org/wieb/webinars/2012/07-12-12CREPC-SPSC.pdf.

[76] As regulated utilities, APS and TEP are required to submit annual compliance reports. These can be found at http://www.azcc.gov/divisions/utilities/electric/environmental.asp.

[77] http://votesolar.org/wp-content/uploads/2011/03/SRP_Comments_VSI.pdf.

[78] APS IRP, p. 147.

[79] SRP IRP, pp. 5–7.

[80] TEP IRP, pp. 21–26.

[81] California Public Utilities Commission, 2011, "33% Renewables" website, http://www.cpuc.ca.gov/PUC/energy/Renewables/hot/33implementation.htm.

[82] WECC, WECC-TEPCC 2022 Common Case: Conventional and Renewable Resource Assumptions.

[83] California Public Utilities Commission, 2009, 33% Renewables Portfolio Standard: Implementation Analysis Preliminary Results, http://www.cpuc.ca.gov/NR/rdonlyres/B123F7A9-17BD-461E-AC34-973B906CAE8E/0/ExecutiveSummary33percentRPSImplementationAnalysis.pdf.

[84] The contribution of individual projects to RPS procurement in California is measured in this spreadsheet: California Public Utilities Commission, 2012, RPS Project Status Table, http://www.cpuc.ca.gov/NR/rdonlyres/054D164B-9DE5-4631-9F05-9CB4C3745B7B/0/RPS_Project_Status_Table_2012_Sept_Final.xls. On customer-owned utilities, see Union of Concerned Scientists, 2012, "The Clean Energy Race: How Do California's Public Utilities Measure Up?" http://www.ucsusa.org/assets/documents/clean_energy/The-Clean-Energy-Race-Full-Report.pdf.

[85] California Public Utilities Commission, 2009, 33% Renewables Portfolio Standard: Implementation Analysis Preliminary Results, p. 10, http://www.cpuc.ca.gov/NR/rdonlyres/B123F7A9-17BD-461E-AC34-973B906CAE8E/0/ExecutiveSummary33percentRPSImplementationAnalysis.pdf.

[86] Category 1 procurement is procurement of energy and RECs delivered to a California balancing authority (CBA) without substituting electricity from another source; Category 2 procurement is procurement of energy and RECs that cannot be delivered to a CBA without substituting electricity from another source; Category 3 procurement is procurement of unbundled RECs only, or RECs that do not meet the conditions for Category 1 and 2. Decision 11-12-052, December 15, 2011, before the Public Utilities Commission of the State of California, http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/156060.PDF. For a detailed summary of RPS procurement trends at the California Public Utilities Commission, see "California's RPS Program: Key Features and Developments," S. Simon, 2012, webinar to the CREPC/SPSC, June 6, http://www.westgov.org/wieb/webinars/2012/06-06-12CREPC-SPSC.pdf.

[87] California Public Utilities Commission, 2011, Decision Implementing Portfolio Content Categories for the Renewables Portfolio Standard Program, Decision 11-12-052, December 15, 2011, http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/156060.PDF.

[88] E.g., dynamic scheduling. The CPUC's "high level" description of Category 1 focuses on these features:

- Energy and RECs from an RPS-eligible facility that is directly interconnected to the distribution or transmission grid within a California balancing authority area (CBA); or
- Energy and RECs from an RPS-eligible facility, that is not directly interconnected to a CBA, but is delivered to a CBA without substituting electricity from another source; or
- Energy and RECs dynamically transferred to a CBA.

S. Simon, 2012, "California's RPS Program."

[89] Tom Wray, Southwestern Power Group, personal communication, September 21, 2012.

[90] For projects to qualify under California's RPS, they must be located near the California border with a first point of connection to an area managed by one of California's grid operators, or a first point of connection outside of California within the Western Energy Coordinating Council (WECC) planning area. Power producers accessing the SunZia line will be able to meet both of these criteria. http://www.westgov.org/wieb/webinars/2012/07-12-12CREPC-SPSC.pdf.

[91] Specifically, SunZia's marketing strategy includes making arrangements with the owners of the Southeast Valley Project (i.e., Hassyampa-Pinal Central 500 kV) for firm point-to-point service (as a counterflow) that would have the electrical effect of providing transmission service from SunZia East Substation to the Palo Verde Hub, which is considered to be within the CAISO's Balancing Authority. Tom Wray, personal communication, September 26, 2012.

[92] See CAISO, April 6, 2011, Straw Proposal, Deliverability of Resource Adequacy Capacity on Interties, http://www.caiso.com/Documents/StrawProposal-Deliverability-ResourceAdequacyCapacityonInterties.pdf.

About Sonoran Institute

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About Headwaters Economics

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