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Transmission Access and Interconnection—Essential Ingredients to Successful Integration of Geothermal Energy

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ABSTRACT

Interconnection and access to reliable interstate transmission capacity are essential elements of a successful geothermal project. Despite the critical role the grid will play in the U.S.'s energy future, the promotion and siting of interstate transmission facilities has historically been left largely to the discretion of individual states: a legacy of an industry built on the basis of vertically-integrated utilities and primary responsibility to the native load customer.

Climate change/green power initiatives and increased emphasis on sustainable domestic energy resources are placing new demands on our electric grid, straining a resource whose adequacy is already questionable. In 2009, the federal government has taken a two steps forward and one step back approach to avoiding the electric form of gridlock, while there continues to be a lack of consensus among the states as to what role the federal government should play with respect to electric transmission.

This paper, and the complementary PowerPoint presentation led by an attorney with over 25 years of experience in the area of alternative power generation, covers recent developments affecting access to and interconnecting with transmission facilities and their implications for the geothermal industry. More specifically, the presentation will cover the aspects of the Obama administration's stimulus package (a.k.a. the American Recovery and Reinvestment Act of 2009)¹ devoted to funding the "Smart Grid"; a February 2009 Circuit Court ruling seriously circumscribing Federal Energy Regulatory Commission ("FERC") transmission siting backstop authority under the Federal Power Act as amended by the Energy Policy Act of 2005² ("EPAct05"); and current efforts to pass federal legislation specifically designed to increase the federal role in transmission facility siting.

Time permitting, the presentation also will highlight the FERC's attempts, through Order 890,³ to strengthen open-access transmission by preventing undue discrimination, enhance enforcement, increase transparency in planning and use of the transmission system. With respect to interconnection, the presentation will cover key points raised by FERC Order 2003 and its progeny, such as defining the capacity of Large Generator Interconnection, jurisdiction issues, pricing and generator responsibility over expenses. The presentation will provide an overview of the various phases of the Process ("LGIP") including queue position, clustering, losing and maintaining queue priority in the initiation process. There will also be discussion regarding the LGIP study and agreement phases, and important Large Generator Initiation Agreement provisions.

Discussion

Although geothermal energy is located everywhere below the surface of the earth and can theoretically be developed close to electric load centers, the current state of the technology and economic considerations typically demand that the present generation of geothermal projects be built over sites with steep thermal gradients close to the surface. Unfortunately, many of the locations where these conditions exist are located far from load centers and, therefore, require substantial transmission facilities be available to transport the power between where it is produced and where it is ultimately used.

¹ The American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009) ("ARRA").

² Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005) (codified in scattered sections of 15 U.S.C.) ("EPAct05").

³ Preventing Undue Discrimination and Preference in Transmission Service, Order No. 890, FERC Stats. & Regs., Regs. Preambles ¶ 31,131 (2007) ("Order 890").

Connecting with, or tying into, existing transmission facilities is often difficult and expensive. There has been limited success in developing uniform standards for interconnection facilities and agreements.⁴ However, much work remains to be done before connecting electric generating facilities to the interstate grid will be as easy as plugging in a new phone or driving a car onto an interstate highway.⁵ The difficulty in interconnecting to existing facilities has been further exacerbated by the high levels of congestion found on many of America's transmission lines due to under investment in the grid. Such congestion can effectively turn reliable 24/7 geothermal power into an intermittent or variable resource, drastically reducing the value and amount of electric output that can be sold by the facility even if it could be designed to be cycled.

Worse still, many project developers find themselves with no transmission facilities, congested or otherwise, within a reasonable distance of what otherwise would be an ideal site for geothermal facility. Moving forward with a project at these locations poses a chicken and egg problem. Utilities are unlikely to build new transmission facilities out to locations that do not have existing demand for such facilities, while developers find it particularly difficult to finance a facility located at a site that is not already served by generation.

Several factors make this a particularly high hurdle to overcome. First, the lead time on a significant new transmission line can be seven to ten years. Given the volatility of the energy markets and short time horizons on government programs to encourage geothermal facilities, it is typically impossible to commit to the development of a new geothermal facility needed to support the decision to go ahead with a transmission line at the time the decision to building the line is being made. Second, delivering geothermal power to where it is most needed often involves the transmission of electricity across state lines and out of state transmission constraints can make or break a geothermal energy project.⁶ Yet, the siting of interstate transmission facilities is largely regulated on a state-by-state basis. Ratepayers and utilities in the states with the geothermal resources often perceive the benefits of siting transmission lines to move power out of state to be smaller than the negatives to the state and utilities in terms of risk and environmental impact. At the same time, the

out-of-state energy industry stakeholders desiring access to the geothermal power that would be produced are powerless to site the needed transmission facilities in the vicinity of the geothermal facility. Thus, both investing in and siting new transmission lines needed to support geothermal facilities frequently lack sponsorship by key entities.

Though the difficulties facing geothermal facilities in accessing and interconnecting with electric transmission facilities are widely recognized, there is no universal agreement that such difficulties reflect flaws in the interconnection and transmission line siting process. Despite such controversy, the federal government is continuing efforts to encourage the development of transmission facilities that could help lower the hurdles to access. It is also taking steps to assert greater authority over the transmission siting process, at least in instances where individual states are perceived to be blocking transmission projects whose benefits to the nation as a whole are judged to outweigh the costs of the project. This paper briefly reports on a few of the advances being made, and setbacks suffered, in this area.

Stimulating the Grid

ARRA became law on February 17, 2009. It is a broad \$787 billion economic stimulus package that places a signicant emphasis on the energy sector of the economy as a way to both create jobs and provide infrastructure for a greener America that will be less dependent on foreign oil than would otherwise be the case. Thirty-four percent of the funds are devoted to "investment" and sixteen percent of that amount is focused on the energy sector. Of the funds earmarked for the energy sector, \$21 billion is allocated to the "Smart Grid". This includes \$3.25 billion a piece to support borrowing by the Bonneville Power Administration ("BPA")⁸ and the Western Area Power Administration ("WAPA")⁹, and which amounts are not intended to ultimately represent a drain on the federal treasury as the amounts borrowed are to be repaid by users of the infrastructure developed with the funds. The law provides for an additional \$10 billion in load guarantees that may go to either renewable energy or transmission projects.¹⁰ ARRA also provides for \$4.5 billion for grants to directly support development of the "Smart Grid".¹¹

⁴ The FERC has developed two sets of generator interconnection standards – one for over 20 MW generation projects and another, somewhat simpler, set for projects that are 20 MW or less in size. See, e.g., Standardization of Generator Interconnection Agreements and Procedures, Order No. 2003-C, 111 FERC ¶ 61,401 (2005); and Standardization of Small Generator Interconnection Agreements and Procedures, Order No. 2006-B, 116 FERC ¶ 61,046 (2006).

⁵ Among other things, geothermal projects must overcome the handicap of their generally intermediate size – too large to take advantage of the streamlined regulations and requirements granted to small generation projects that are easily accommodated by the existing electric grid and too small to enjoy the economies of scale that allow competing generation projects to spread the costs of more thorough study requirements and longer interconnection study periods over a significant greater number of kilowatt-hours. To date, the FERC has not seen fit to issue any geothermal generation specific interconnection rules, unlike the special treatment that has been given to wind generation facilities in deference to their unique characteristics. *See Interconnection for Wind Energy, Order No. 661-A*, 113 FERC 61,254 (2005).

⁶ For example, "[m]uch of the transmission constraints for Idaho customers exist outside of the state." Daniel J. Fleischmann -- Geothermal Energy Association, *Geothermal Development Needs in Idaho*, November 2006, *available at:* <u>http://www.geo-energy.org/publications/reports/Idaho%20Geothermal%20Report.</u> <u>pdf</u> (last visited June 3, 2009).

⁷ Liz Sidoti and Tom Raum, *Obama Signs Stimulus Bill, Readies Homeowner Plan*, Feb. 17. 2009, *available at:* <u>http://news.yahoo.com/s/ap/20090217/ap_on_</u> go_pr_wh/obama_stimulus (last visited, May 12, 2009).

⁸ Id. § 401.

⁹ Id. § 402.

¹⁰ Id. § 1400U-1(a)(4).

¹¹ Id. Title IV.

Among the positives here are:

- \$21 billion in federal support for upgrading the U.S. tranmisssion system represents a very considerable increase in funding as compared to the prior administration;¹²
- WAPA and the BPA are very likely to use the vast majority of their loan guarantees to support development of transmission facilities in the West, where most of the current generation of geothermal facilities are likely to be sited; and
- Prior federal funding restrictions that largely limited federal spending to modest, experimental programs have been lifted, opening up the available funds to be used by larger projects using fully proven technologies forming the backbone of the transmission grid.¹³

Despite these very welcoming and beneficial aspects of ARRA, the law is far from a silver bullet for the geothermal industry, creating a transmission grid that is the equivalent of our current interstate highway system, allowing for easily moving electricity from wherever it is produced to major electric markets. Some of ARRA's key shortcomings in this area are:

- As an economic stimulous bill, the funds are being directed to "shovel ready" projects that can be implemented quickly. This will include upgrading existing transmission lines (by, for example, retrofitting digital/electronic monitoring and control devices) and constructing new transmission lines that were already well along the planning and siting process.¹⁴ Most of these enhancements are likely to be of little benefit to, as yet to be developed, geothermal projects. Unfortunately, ARRA is not likely to be much of a boon to building greenfield transmission projects to serve, as yet, unbuilt geothermal generation plants. The long lead time for those transmission projects will largely preclude them from qualifying for ARRA funds/support;
- \$21 billion dollars is woefully inadequate to convert our nineteenth century transmission facility into a twentyfirst century transmission system. It has been estimated that merely fitting the existing transmission system with Supervisory Control And Data Acquisition and Digital Control Systems could cost \$500 billion.¹⁵ While such updating would help us to use existing facilities more efficiently and completely and reduce congestion constraints, it would not advance the reach of facilities by

even one foot in the direction of serving areas currently without transmission lines; and

The law does not facilitate the siting of new transmission facilites, a problem that effectively blocks the deployment of any available capital for the purposes of extending the reach of the transmission grid.

Limitations on the Federal Energy Regulatory Commission's Backstop Siting Authority

While Congress has yet to seize comprehensive control of interstate transmission facility siting, the EPAct05 did direct the Department of Energy ("DOE") to establish National Interest Electric Transmission Corridors ("NIETCs") where needed and granted the FERC limited siting authority of transmission facilities situated within a NIETC. The DOE and FERC have endeavored to make good use of this authority. In 2007 (as upheld on rehearing in 2008), the DOE designated two large swaths of the country as NIETCs.¹⁶ Further, the FERC adopted a rule that would have allowed it to effectively overturn a state denial of a transmission line siting application for a route within a NIETC and impose the FERC's judgment on the state as to whether such a route should be implemented.¹⁷

Unfortunately, these efforts have not served to forward the cause of geothermal power. First, the location of the NIETCs was not designed to encourage the development of transmission lines running between geothermal hotspots and load centers. One of the corridors (the Mid-Atlantic Area National Corridor) includes certain counties in Ohio, West Virginia, Pennsylvania, New York, Maryland, Virginia, and all of New Jersey, Delaware, and the District of Columbia. Areas not known for their extensive geothermal resources. The other corridor (the "Southwest Area National Corridor") comes closer to fitting the needs of geothermal resources and includes certain counties in California and Arizona, but still fails to include regions through which most geothermal generation must cross to be delivered to market.¹⁸ Second, the FERC's effort to read its EPAct05 siting authority expansively has been called into doubt in the wake of a challenge brought by two state utility commissions and others.

Specifically, on February 18, 2009, in the case of *Piedmont Environmental Council v. FERC*,¹⁹ the United States Court of Appeals for the Fourth Circuit held that the FERC cannot authorize the siting of electric transmission facilities (and in so doing bestow the often essential right of eminent domain upon the transmission facility developer) if a state has affirmatively denied a permit application for the facilities.²⁰ The court found

¹² Energy Independence Act, 42 U.S.C. § 1301-09 (2007).

¹³ ARRA § 1705.

¹⁴ Id. § 1705.

¹⁵ Steve Hargreaves, *Green Stimulus: Show Me the Money*, Jan. 22, 2009, *available at:* <u>http://money.cnn.com/2009/01/21/news/economy/green_</u> stimulus/?section=money_latest (last visited May 12, 2009).

¹⁶ National Electric Transmission Congestion Report and Order, 72 Fed. Reg. 56,992 (Oct. 5, 2007).

¹⁷ Filing Applications for Permits to Site Interstate Electric Transmission Facilities, 71 Fed. Reg. 69,440 (Nov. 16, 2006).

¹⁸ Ironically, while Nevada presents a significant bottleneck to geothermal generation trying to reach California, the one Nevada county (Clark) originally proposed to be included in the Southwest Area National Corridor was omitted from the corridor as finally adopted.

¹⁹ Piedmont Environmental Council, et al. Nos. 07-1651, et al. (4th Cir. Apr. 2, 2009).

²⁰ Id. at 9.

that to do otherwise would mean that state commissions will lose jurisdiction unless they approve every permit application for facilities located in a national interest corridor and concluded that "if Congress had intended to take the monumental step of preempting state jurisdiction *every time* a state commission denies a permit for facilities in a national interest corridor, it would surely have said so directly."²¹

Despite these disappointments, some hope remains for geothermal project developers. First, the DOE is required to perform transmission congestion studies (which can lead to the establishment of additional NIETCs) on a tri-annual basis. The last study cycle occurred in 2006, making 2009 another study year. Comments from the public were collected in 2008 for the 2009 study, and, while geothermal interests were far from the loudest voice, some information supporting the development of NIETCs that could serve geothermal resources was submitted. Areas where geothermal resources are co-located with solar and wind resources, such as the southwest corner of Utah, and that are not too remote from existing transmission lines, load centers or one of the existing NIETCs may find themselves included in a NIETC. Yet, interests and states with known "stranded" geothermal resources declined to participate in the NIETCs process. With another round of comments due to be collected in 2011, it is not too soon for geothermal energy interests to consider how they could make their needs heard.²²

Second, on April 2, 2009, the FERC filed a petition with the Fourth Circuit seeking rehearing en banc²³ of the court's decision overturning the FERC's interpretaton of its siting authority under EPAct05. The FERC argues that under prevailing U.S. Supreme Court precedent,²⁴ the federal courts must defer to an agency's permissible interpretation of ambiguous statutory language and that the language must be ambiguous because the Fourth Circuit's decision was based on a 2-1 split of the judges with regard to the meaning of the statutory provision upon which the FERC relied for its claim of siting authority where a state denies a siting certificate to a transmission project.²⁵ Even if the Fourth Circuit's current ruling stands, the FERC continues to hold a backstop siting role pursuant to EPAct05 in instances where (1) a state fails to make an up or down siting decision within 12 months, or (2) the state attaches unreasonable conditions to an approval.

Congress Considers Giving the FERC a Greater Role in Electric Transmission

Ironically, the court's determination that the FERC lacks the authority to overrule timely state siting decisions blocking the siting of transmission facilities may prove to be the impetus required to pass legislation greatly enlarging the FERC's role in siting interstate electric transmission facilities. On March 12, the Acting Chairman of FERC, Commissioner Jon Wellinghoff, testified before the Senate Committee stating, in part:²⁶

"As [President Obama] noted in his February 24 speech to Congress, the recovery plan developed by the White House and Congress calls for doubling our supply of renewable energy in the next three years.... The President also stated that we will soon lay down thousands of miles of power lines that can carry new clean energy to cities and towns across this country."²⁷

"[T]o implement these goals, there must be a mechanism to invoke federal authority to site the transmission facilities necessary to interconnect renewable power to the electric transmission grid and move that power to customer load. We need a National policy commitment to develop the extra-high voltage (EHV) transmission infrastructure to bring renewable energy from remote areas where it is produced most efficiently into our large metropolitan areas where most of this Nation's power is consumed."²⁸

While earlier draft bills had provided the federal government with a primary siting role, Commissioner Wellinghoff's remarks were tellingly vague as to the circumstances under which federal siting authority would be invoked. Subsequent drafts of federal energy legislation have been leaning toward giving states the first crack at transmission line siting. As of early June, Senate Energy and Natural Resources Committee majority members were pushing a bill that would adopt an approach similar to FERC's original reading of EPAct 2005, giving each state one year to consider any transmission siting requests in high-priority corridors and allowing FERC to exercise authority where a state denies such request, attaches unreasonable conditions upon an approval, or fails to make an up or down decision within one year.²⁹ On the Senate side, transmission siting provisions are just one component of a more comprehensive energy bill, that provides legislators with the ability to do some horse trading, but also brings in other thorny issues, both with respect to transmission legislation (e.g., cost allocation

²¹ *Id*. at 17.

²² While an in depth discussion is beyond the scope of this paper, it should also be noted that the Federal government has substantial landholdings in the West and that the siting of transmission facilities on those lands is subject to Federal jurisdiction. However, the need for a complete transmission path means that even where the majority of a proposed transmission route runs through federal lands, states still hold a trump card. If even a short section of the transmission line must pass through non-federal land, affected states can block transmission lines that they oppose.

²³ Brief of Respondent, Piedmont Environmental Council, et al. Nos. 07-1651, et al. (4th Cir. Apr. 2, 2009) ("Respondent's Brief").

²⁴ Respondent's Brief at 6 (FERC relies on Chevron U.S.A. v. Natural Resources Defense Council, 467 U.S. 837 (1984)).

 $^{^{25}}$ Id.

²⁶ Testimony of Acting Chairman Jon Wellinghoff, Federal Energy Regulatory Commission, Before the Committee on Energy and Natural Resources United States Senate Hearing on Legislation Regarding Electric Transmission Lines, *available at <u>http://www.ferc.gov/eventcalendar/Files/20090312100013-03-12-09-testimony.pdf</u> (last visited May 12, 2009).*

²⁷ Id.

 $^{^{28}}$ *Id*.

²⁹ Siting of Interstate Electric Transmission Facilities, §216 (h)(1)(B) (Draft legislation, *available at*: <u>http://energy.senate.gov/public/_files/END09773_xml.pdf</u> (last visited, June 3, 2009) ("Bingaman Legislation").

and the relative priority given to lines serving green power versus broader reinforcement and expansions of the transmission grid) and a whole spectrum of controversial energy issues.³⁰

In the House of Representatives, the Committee on Energy and Commerce was working on legislation entitled the "American Clean Energy and Security Act of 2009," championed by Committee Chairman Henry Waxman and Energy and Environment Subcommittee Chairman Edward J. Markey.³¹ While this draft bill is also in the form of comprehensive legislation and deals with both the "Smart Grid" and transmission planning, the draft bill did not address federal transmission siting authority. That topic was, instead, the subject of the more narrowly focused draft National Clean Energy Superhighways Act of 2009 ("Superhighways Bill") introduced by Congressman Jay Inslee.³² The Superhighways Bill would require proposed transmission line projects that would operate at over 345kV, act as a renewable energy feeder line or be a necessary upgrade of an existing facility to obtain a Certificate of Public Conveninece and Necessity ("CPCN") from the FERC.³³ Only projects included within a regional plan would be permitted to apply to the FERC for a CPCN. The bill includes a process for regional planning to be conducted by groups of states.³⁴ However, should the states fail to form appropriate regional planning groups (within a year of passage of the bill) or to develop an acceptable plan within one year of the FERC certifying the relevant regional group, the FERC is directed to develop a regional plan covering the relevant area.35

While both houses are, thus, considering somewhat similar approaches to federal authority over transmission siting and the majority held by the democrats means that bipartisan support is not required to pass legislation, there is still a great deal of doubt any energy legislation that includes federal transmission siting authority will pass in the current session of Congress. When it comes to energy, positions do not divide neatly along party lines. Instead, local and regional interests dictate the positions legislators take. In this regard, it is notable that on May 1, 2009, the Western Governors Association, which represents the geographic region where most of the best geothermal resources are located,³⁶ wrote to the Senate Energy and Natural Resources Committee Chairman Jeff Bingaman: "We see little benefit in FERC pre-empting state transmission line permitting processes. The major hurdle for permitting transmission in the West has been securing permits from federal agencies."³⁷ Clearly, the desire of these states to develop geothermal resources does not trump their concern over maintaining control of transmission line siting.

Historically, to achieve a critical mass to pass significant new energy legislation required the passage of time to allow the need for energy legislation to arise on multiple fronts. Only then could enough votes be gathered to upset the status quo.

Nevertheless, the federal government clearly intends on improving our electric transmission system as a necessary supporting element to achieving the administration's goals of improving energy independence, reducing greenhouse emissions and stimulating the economy. In implementing such a strategy, substantial taxpayer funds will be spent on transmission system upgrades, and the federal government can be expected to demand a significant say in how those funds are spent. Increased federal regulation and authority are logical corollaries to such action. A tradition of state siting authority and strong local sentiments are likely to act as dampers to a blatant federal power grab, but such impediments are not likely to yield to national need in the long run. So, the question is likely to be how much authority will Congress hand over to the executive branch, not whether that will occur at all.

Other Developments

Traditionally, when new transmission facilities have been constructed to serve a specific generating project, rather than reinforce the grid generally, the cost of such new facilities has been the responsibility of the generating project benefiting from the new transmission facilities. The impetus for comprehensive energy legislation provides an opportunity for the allocation of cost responsibility to be reconsidered. Draft pieces of legislation being worked on in both houses in Congress in May provided some additional prospects for the socialization of transmission costs. In particular, the Senate draft bill included the following provision:

"[The FERC] may permit allocation of costs for highpriority national transmission projects to load-serving entities within all or a part of a region, except that costs shall not be allocated to a region, or subregion, that are disproportionate to reasonably anticipated benefits."³⁸

Similarly, the draft Superhighways Act, under consideration in the House of Representatives, provides for the broad allocation of transmission project costs, the purpose of which is: "to ensure that the costs of [transmission] projects are borne widely by all beneficiaries of new transmission and are not borne disproportionately by ratepayers or generators in specific areas"³⁹ Thus, while

³⁰ Clean Renewable Energy and Economic Development Act (Draft legislation, *available at*: <u>http://thomas.loc.gov/cgi-bin/query/z?c111:S.539</u> (last visited, June 4, 2009).

³¹ American Clean Energy and Security Act of 2009 (Draft Legislation posted by Rep. H. Waxman and Rep. E. Markey, on March 31, 2009), *available at:* <u>http://</u> <u>energycommerce.house.gov/Press_111/20090331/acesa_discussiondraft.pdf</u> (last visited, May 12, 2009).

³² National Clean Energy Superhighways Act of 2009, H.R. 2211, 111th Congress, § 216A (2009) ("Superhighways Act").

³³ Id.

 $^{^{34}}$ Id.

³⁵ Id.

³⁶ The Western Governors Association represents 17 Western States in the lower 48, plus Alaska, Hawaii and a few other jurisdictions.

³⁷ Text of letter available at: http://www.westgov.org/wga/testim/transmission5-1-09.pdf (last visited June 3, 2009).

³⁸ Bingaman Legislation, § 216(h)(1)(B).

³⁹ Superhighways Bill, § 216A.

geothermal facilities may always be responsible for the costs of a dedicated line between their plant and the transmission grid, in the future the public may be picking up a greater share of the costs of wiring geothermal plants into the grid.

Conclusion

Conditons are ripe for changes to the federal government's role in guiding the development of the U.S. electric transmission sector. It is likely that the full effect of these changes will only be felt over a significant period of time, but changes in the reach of the electric transmission system and the pace at which new transmission facilities can be sited promise to have game changing impacts for the future of geothermal energy and the electric industry as a whole. Federal policy makers already receive a huge amount of input from electric industry stakeholders and members of the geothermal community cannot hope to be heard over all the other voices through a buckshot approach to participating in government policy making. They will need to expend their resources wisely, carefully choosing where and how to deliver a compelling message.