U.S. Department of Energy
Washington, DC 20585

Date: **August 20, 2014**

To: **Members of the Public**

From: **Quadrennial Energy Review Task Force Secretariat and Energy Policy and Systems Analysis Staff, U.S. Department of Energy**

Re: **Stakeholder Meeting on Infrastructure Siting**

1. Introduction

On January 9, 2014, President Obama issued a Presidential Memorandum establishing a Quadrennial Energy Review (QER). The Secretary of Energy provides support to the multi-agency QER Task Force, including coordination of activities related to the preparation of the QER report, policy analysis and modeling, and stakeholder engagement.

The first year of the QER concentrates on the energy transmission, storage and distribution (TS&D) infrastructure that links energy supplies to intermediate and end users. To identify opportunities to improve the nation's infrastructure for transmission, storage and distribution of energy, the QER will identify the threats, risks and opportunities for U.S. energy and climate security, enabling the federal government to translate policy goals into a set of integrated actions. Meeting these goals is essential to improving U.S. economic productivity, enhancing quality of life, protecting the environment, and ensuring the nation's security.

On Thursday, August 21 at the Little America Hotel in Cheyenne, Wyoming, the U.S. Department of Energy (DOE), acting as the Secretariat for the QER Task Force, will hold a public meeting to discuss and receive comments on energy infrastructure siting issues.

The QER stakeholder meeting in Cheyenne is an opportunity for state government officials, infrastructure developers, representatives of utilities and the oil and gas industry, community leaders, environmentalists, and other stakeholders to give their input to the QER on how the United States can improve the planning and siting processes for building new transmission, storage and distribution (TS&D) infrastructure to make our energy system more reliable, secure, affordable and clean. In addition to planning and siting, cost allocation is the third critical element for building new TS&D infrastructure. Issues of cost allocation and utility business models will be discussed at a future stakeholder meeting to be held in Newark, NJ on September 8, 2014. The primary goals of the Cheyenne meeting will be to highlight the key lessons learned in siting and planning new TS&D infrastructure that can be applied to national policy and identify the gaps that could be addressed through executive or legislative action, or identify research and development needs.

Following opening remarks by cabinet and elected officials, two expert panels will explore federal, state and local siting issues for electricity transmission and for oil and gas pipelines. The third panel of the day will discuss data needs, mitigation, and tools for siting and permitting. There will be an opportunity for public comment via an open microphone session following the

panels. Written comments can be submitted to QERcomments@hq.doe.gov. The session will also be webcast at www.energy.gov/live. Information on all QER stakeholder meetings is posted at www.energy.gov/qer as it becomes available.

This briefing memorandum will briefly touch upon some of the changes in the nation's energy profile that affect TS&D infrastructure and give a broad overview of the federal and state roles in siting and permitting new energy infrastructure.

2. Federal agency roles in infrastructure siting

Although a full discussion of all of the federal agencies and statutes regulating infrastructure siting is beyond the scope of this memorandum, this section contains a brief summary of the most common federal issues relevant to project siting.

Federal agencies have siting authority over proposed infrastructure projects that cross federal land or water, interstate natural gas pipelines, and interstate electricity transmission projects. In states where most of the land is federal land, federal agencies make the key siting decisions. At least nine federal agencies issue permits for transmission projects crossing federal land, waters or international borders.

Rights-of-way through federal public lands may be granted by the Secretary of the Interior or Secretary of Agriculture—depending on the jurisdiction of the land being crossed—to qualified persons for a pipeline to transport oil or natural gas or for a pumping station. Permission may be granted for the ground occupied by the pipeline and 25 feet on each side. Unless the pipeline is a natural gas pipeline operated by a person subject to regulation under the Natural Gas Act, or by a public utility subject to regulation by a state or municipal regulatory agency, a pipeline can qualify for such easement only if it is maintained as a common carrier.

Depending on the areas through which a pipeline or transmission line is proposed, there are a variety of other permitting processes that may apply: Section 401 Clean Water Act water quality certificates; Section 404 dredge and fill permits from the Army Corps of Engineers; NPDES discharge permits; Coastal Zone Management Act determination of consistency; Endangered Species Act consultation; Historic Preservation Act consultation; and impact determination, in addition to state and local permits.

Pipelines and powerlines that cross tribal lands—inter- or intrastate—must also be approved by the tribal government and federal government. Federal approval will include environmental protection requirements, as well as requirements that apply under other federal laws to protect historic and cultural resources.

The U.S. Army Corps of Engineers evaluates permit applications for infrastructure construction projects in US waters, including rivers and harbors.

The U.S. Department of Interior's Bureau of Land Management (BLM) oversees a considerable extent of public lands with the potential to make significant contributions to the nation's energy portfolio. The BLM ensures that proposed projects meet all applicable environmental laws and regulations and works with local communities, the states, tribes, industry and other federal agencies in the approval process, maintaining four Renewable Energy Coordination Offices and five oil and gas Pilot Offices to facilitate reviews. BLM also participates in a Cabinet-level working group that is developing a coordinated federal permitting process for siting new transmission projects that would cross public, state, and private lands.

Sec. 368 of the Energy Policy Act of 2005 required the U.S. Departments of Interior, Agriculture (USDA), Commerce, Defense and the DOE to work together to designate energy rights-of-way corridors oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities on federal lands in the West. Section 368 also directs the agencies to research the need for upgraded infrastructure and to take actions to improve reliability of the grid.

Energy corridors on federal lands are selected to minimize regulatory conflicts and impacts on environmental and cultural resources, and address concerns of local communities. The designation of energy corridors can help expedite the siting, permitting, and review processes for projects within such corridors, as well as improve the predictability and transparency of these processes. A 2013 Presidential Memorandum required the federal agencies to identify energy corridors, and revise corridors that have been previously identified.[3]

Under the National Environmental Policy Act of 1969 (NEPA), any proposal requiring major federal action (such as approving a major pipeline or electricity transmission project) requires a detailed statement by the responsible official on the environmental impact of the proposed action, along with alternatives to the proposed action. Federal agencies work with the applicant to conduct an environmental assessment or environmental impact statement, which can take a long time.[4] The agency then makes a decision on the siting request by the developer as part of a record of decision in light of the final environmental impact statement. The statement must

[3] Presidential Memorandum on Transforming our Nation's Electric Grid Through Improved Siting, Permitting and Review, June 2013, http://www.whitehouse.gov/the-press-office/2013/06/07/presidential-memorandum-transforming-our-nations-electric-grid-through-i

[4] The multistate Gateway West transmission in the northwest was first proposed in 2007. The Bureau of Land Management released its record of decision in November 2013 on the siting of the line for eight of the ten segments involving Federal land segments. A decision on the remaining two segments has not been reached yet. One estimate is that the line will not be in operation until 2023. On the other hand, shorter transmission lines can be planned, sited and constructed in several years typically when the segments are short. Many such segments are underway currently in regions with large amounts of coal plant retirements as one way to address those retirements.

contain sufficient discussion of the relevant issues and opposing viewpoints to enable a decision-maker to analyze environmental factors and make a decision.[5]

Timelines for approval vary and hurdles exist across the process. Many federal agencies will not begin their approval processes until state and local permitting processes (described below) are completed.[6] Schedules are also affected by incomplete applications to the federal agencies and delays in the multiple agency reviews required at the local, state and federal levels.[7] The entire process of planning a new electricity transmission line, developing a cost allocation scheme, garnering approval from various Federal and state agencies, and obtaining permission for siting can range from 7.5 to 13 years.[8]

3. Executive Order on Improving Performance of Federal Permitting and Review of Infrastructure Projects

In March of 2012, President Obama issued an executive order to speed up federal agency reviews of infrastructure projects because of their importance to the economy. The order explicitly applies to federal agency reviews of electricity transmission projects, pipelines, and renewable energy generation developments. The order requires federal agencies to coordinate with tribal, state, and local governments to avoid duplicating reviews and allow for concurrent rather than sequential reviews of project applications. Federal agencies must set timelines for completing project reviews and track progress to those goals.[9]

The Executive Order also established a steering committee of federal agencies, including the Department of Energy, to implement improvements in managing federal applications for permits and review of infrastructure projects.[10] For example, for the proposed Great Northern Transmission Line, the Department of Energy initiated monthly meetings with other federal and non-federal government agencies and the project developer. Through these meetings, the

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[5] 61 Am. Jur. 2d Pipelines § 13

[6] GAO (U.S. Government Accountability Office). 2013. Pipeline Permitting: Interstate and Intrastate Natural Gas Permitting Processes Include Multiple Steps, and Time Frames May Vary. GAO. Accessed August 5, 2014: http://www.gao.gov/assets/660/652225.pdf

[7] Ibid.

[8] http://www.nema.org/Policy/Documents/tc-gameboard-4web.pdf

[9] Executive Order -- Improving Performance of Federal Permitting and Review of Infrastructure Projects, March 22, 2012, available at http://www.whitehouse.gov/the-press-office/2012/03/22/executive-order-improving-performance-federal-permitting-and-review-infr

[10] Executive Order -- Improving Performance of Federal Permitting and Review of Infrastructure Projects, March 22, 2012, available at http://www.whitehouse.gov/the-press-office/2012/03/22/executive-order-improving-performance-federal-permitting-and-review-infr

developer was able to narrow down potential corridors to two routes in their application, ensuring a faster review process.[11]

4. Electricity Transmission, Storage & Distribution Siting

> "Transmission siting is the process of determining specifically where new transmission projects will be located. It incorporates the planning process into other processes such as obtaining right-of-way and complying with local zoning ordinances."[12]
>
> American Electric Power

To serve a 21st century consumer base, the electricity grid must adapt to emerging challenges and opportunities: fluctuating energy prices, integration of distributed energy resources, integration of utility-scale renewables and demand response technologies, the need for improved resilience, and the need to reduce carbon pollution. The future grid will accommodate and rely on an increasingly wide mix of resources, including large centralized and more diffuse distributed generation – some of it intermittent in nature. Energy storage may also play an important role.

The U.S. transmission and distribution system is a vast complex of interlocked machines, wires, and regulations. This dynamic web must be continually and actively managed to maintain system reliability and functionality. Every year, the U.S. grid delivers 3,857 terawatt hours (TWh)[13] of electrical energy from electric power generators to 144 million residential, commercial, and industrial customers. This is accomplished via 283,000 miles of high-voltage transmission wires, 70,000 substations, and 2.2 million miles[14] of local distribution circuits.[15]

The grid delivers electricity to end-use customers through a diverse system of over 3,200 privately, publicly, and cooperatively owned electric utilities.[16] In addition to these, there are

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[11] White House Fact Sheet - Building a 21st Century Infrastructure: Modernizing Infrastructure Permitting, May 14, 2014, available at http://www.whitehouse.gov/the-press-office/2014/05/14/fact-sheet-building-21st-century-infrastructure-modernizing-infrastructu

[12] Siting, the issue, American Electric Power, available at https://www.aep.com/about/IssuesAndPositions/Transmission/Siting.aspx

[13] DOE, Energy Information Administration (EIA), "Annual Energy Outlook 2014" (May 7, 2014), http://www.eia.gov/forecasts/aeo/MT_electric.cfm.

[14] Harris Williams & Co., "Transmission & Distribution Infrastructure" (Summer 2010), http://www.harriswilliams.com/sites/default/files/industry_reports/final%20TD.pdf.

[15] Here, a "customer" is defined as the electricity consumed at one electric meter. Thus a customer may be a large factory, a commercial establishment, or a residence. A rough rule of thumb is that each residential electric meter serves 2.5 people.

[16] DOE, EIA, "Electric Power Annual 2012," Form EIA-861 (December 2013).

wholesale-only entities that generate or trade electricity, operate power plants, and/or operate the transmission system itself. Because these systems are interconnected, they require a complex system of state and federal regulatory oversight to ensure function, resilience, and reliability. A 2008 estimate suggested that investment needs for electric infrastructure could be as high as $2 trillion between 2008 and 2030, with $298 billion directed toward transmission and $582 billion toward distribution systems.[17] Such predictions are necessarily speculative, but in the past six years, uncertainty surrounding investment requirements for the U.S. grid has only grown. Some of the factors that have contributed to this uncertainty include lower economic growth, state energy efficiency mandates on utilities, increasing use of demand response, and increasing implementation of distributed generation. A lengthy and complex siting process adds an additional layer of uncertainty to future grid investments.

States Role in Siting New Electricity Transmission

In almost all states, public utilities commissions are the agency with siting authority over electricity infrastructure. Each state has different procedures to follow for approving a transmission line. Some states require the developer to demonstrate the necessity of new transmission capacity and some states require the consideration of non-transmission alternatives. Some states mandate that all types of transmission lines be fully permitted before construction can start, while others only have siting requirements above certain voltage levels.

State law gives utilities that develop transmission projects eminent domain authority over private lands, which means they can take private property for transmission lines as long as they compensate the landowner.

There are common features to state transmission siting processes.[18] Typically, a developer will submit an application to the state siting agency that demonstrates the necessity of the new transmission line, including certification that it maintains electricity reliability or is needed to connect new generation. The application will contain a proposed route for the transmission lines and a cost estimate. State public utilities commissions usually hold public hearings to examine the proposed route and its impact on local communities, landowners and the environment.

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[17] Brattle Group, "Transforming America's Power Industry: The Investment Challenge," produced for the Edison Electric Institute (2008).

[18] A listing of each state's siting process is in "State Generation &Transmission Siting Directory", Edison Electric Institute, October 2013 and updated regularly. A January 2014 preliminary draft for review "Transmission Planning Whitepaper" by Navigant for the DOE-funded Eastern Interconnection States Planning Council, has "Appendix B. Overview of State Transmission Siting and Approval Process". Appendix B contains three maps of the U.S. and one table that graphically summarize how states vary and are alike on their siting. See http://communities.nrri.org/documents/68668/9bd8c309-10c0-4eb9-8f45-89001293aa12

Typically, the most important issues the state PUC reviews are the economic and operational need for the proposed project and the impact the project would have on the environment.[19]

Proposed transmission lines that cross state boundaries require the developer to obtain site permits from each state involved, each with its own timeline and process. Edison Electric Institute's annual transmission investment report noted that 52 percent of the value of its members active transmission projects are for interstate transmission lines.[20] A number of long-distance multistate lines have been proposed for wind and solar energy resources far from electricity users in urban areas.[21]

Some states have taken many years to site transmission lines that cross several states because of the process itself or controversy over the proposed line. A 113 mile 765 kV line from West Virginia to Virginia has been cited as the "poster child" for siting difficulties, because it took 14 years to site and two years to build.[22]

A number of states have proposed legislation to improve state siting processes. The National Council of State Legislatures reports that Georgia, Maine, New Jersey, New York, and New Hampshire have pending legislation that would affect state transmission line siting. Virginia recently enacted a law that eliminates state siting for lines lower than 138 kV if the state PUC finds that the line is needed and that the proposed route "will minimize adverse effects on scenic assets, historic districts and the environment."[23]

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[19] Zichella, Carl and Hladik, Johnathan, America's Power Plan, available at http://americaspowerplan.com/site/wp-content/uploads/2013/09/APP-SITING-PAPER.pdf

[20] p. 153, "Transmission Line Projects: At a Glance", Edison Electric Institute, March 2013, updated annually.

[21] On the other hand, two separate analyses undertaken by the Western Governors Association under its DOE-funded Western Renewable Energy Zones Project, as well as analyses done by the Western Electricity Coordinating Council for its System Planning Steering Committee that focuses on actual planned transmission in the west, is showing that, at least in the West, that most new transmission lines for long-distance renewable energy need only go to one or two neighboring states, and not the multiples of states that were originally envisioned for access to remote renewable energy sources to satisfy state renewable portfolio mandates. These results have been reported over the last several years at biannual meetings of the Western Interstate Energy Board's Committee on Regional Electric Power Cooperation. Long distance lines may be more justified in the eastern half of the U.S. should market conditions or state/Federal policies dictate more long distance renewables in the east. Confounding long transmission lines are counter trends for more local central generation, such as natural gas-fired; continued expansion of ratepayer-funded energy efficiency; demand response; emerging distributed generation in some areas; and continued low economic growth.

[22] "Transmission Siting and Permitting", David Meyer and Rich Sedano, Issue Paper, National Transmission Grid Study, U.S. Department of Energy, May 2002 and American Electric Power, Siting available at https://www.aep.com/about/IssuesAndPositions/Transmission/Siting.aspx (accessed August 17, 2014).

[23] "States Walk the Lin e: Current State Action Towards More Efficient, Secure, and Cost Effective Electricity Transmission", Cassandra Brown, National Council of State Legislatures, July 2013. Included is a listing of enacted and pending 2013 legislation.

Regional Role in Siting New Electricity Transmission

The Energy Policy Act of 2005 amended Section 216(i) of the Federal Power Act to allow three or more states to form an interstate compact to conduct the siting of transmission in their states. No states have used this provision of the 2005 law. However, the Council of State Governments in 2013 developed model state siting compact legislation.[25] Some states have cooperated informally to better coordinate transmission siting.

Several regional governors' groups have issued joint statements on transmission siting pledging cooperation among their states on siting of interstate lines. In June 2002, the governors of eight western states signed a transmission siting protocol among themselves and four federal agency heads that pledged cooperation on transmission siting. To date, that protocol has not been used by the western states among themselves as they have been able to use informal means to cooperate on interstate lines.[26] Their main concern remains delays with Federal agency transmission siting practices.

In 2011 the Western Governors' Association created a Transmission Siting Task Force to help its state members on their state siting practices and work with the federal agencies with jurisdiction over substantial parts of the West.[27] In 2005, 12 Midwestern governors, through the Midwest Governors Association, signed an agreement to work together on transmission siting.[28]

In 2009, six New England states jointly adopted a Renewable Energy Blueprint that called for coordinated renewable energy procurement and also coordinated state siting of transmission lines. These states created an Interstate Siting Collaborative to help implement the blueprint, including consideration of concurrent timelines for state siting processes and common applications.[29]

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[25] http://www.csg.org/NCIC/TransmissionLineSitingCompact.aspx

[26] "Protocol Among the Members of the Western Governors' Association, The U.S. Department of the Interior, The U.S. Department of Agriculture, The U.S. Department of Energy, and the Council of Environmental Quality Governing the Siting and Permitting of Interstate Transmission Lines in the Western United States", see http://www.westgov.org/wieb/electric/Transmission%20Protocol/9-5wtp.pdf

[27] WGA's task force is "comprised of state siting representatives, developers, nongovernmental organization, and local community leaders….[T]he job of the task force is to: [b]uild tools and best practices for siting transmission; [c]reate an online toolkit to host information for comparing state processes, MOU templates, public outreach strategies, and best practices for mitigation and ongoing regional efforts; [e]ngage all levels of government to develop collaboration and cooperation on these efforts; and [w]ork with federal land agencies to develop and institutionalize best practices." See http://www.westgov.org/index.php?option=com_content&view=article&id=311&Itemid=81.

[28] "Midwestern Governors Cooperate to Promote Electric Transmission Investment", PRNewswire, July 16, 2005. The Midwestern Governors Association has also hosted three (DOE-funded) events to discuss regional transmission collaboration, see http://www.midwesterngovernors.org/Transmission.htm.

[29] "New England States Form Interstate Transmission Siting Collaborative", press release, New England States Council on Electricity, June 23, 2011.

The American Reinvestment and Recovery Act (2009) including funding for long-term analysis and planning across the three interconnections that serve the lower 48 United States. These studies are identifying transmission requirements under a range of electricity futures and developing long-term interconnection-wide expansion plans. State agencies or groups of agencies were also funded to develop coordinated interconnection priorities and planning processes.[30]

Federal Role in Siting New Electricity Transmission

Over the coming decade, the federal role in new transmission construction is likely to be significant. A March 2014 survey of utilities by the Edison Electric Institute showed that 43 percent of proposed spending for new lines between 2014 and 2024 will go to projects that span two or more states – which would place them under federal jurisdiction.[31]

The Federal Energy Regulatory Commission (FERC) is responsible for regulating interstate electricity transmission for much of the U.S. wholesale electricity market. FERC's most significant recent rulemaking was Order 1000 (2011), which required public utility transmission providers to participate in regional planning processes, establish procedures to identify transmission needs and coordinate with neighboring transmission regions to determine the most efficient solutions for meeting transmission needs. The U.S. Court of Appeals for the District of Columbia Circuit affirmed Order 1000 on August 15, 2014.

Congress enacted Sec. 216(h) of the Energy Policy Act of 2005 in response to state and utility industry views on the need to improve the federal role on electricity transmission siting. Under Section 216(h), Congress granted DOE authority to coordinate federal agencies involved in transmission projects. DOE is now completing a final rule to implement the 2005 provision.[32] In 2009, the Department of Energy (DOE), the White House Council on Environmental Quality (CEQ), the Department of Interior (DOI), the Department of Agriculture (USDA), the Department of Commerce, the Department of Defense, the Environmental Protection Agency, the Federal Energy Regulatory Commission (FERC), and the Advisory Council on Historic Preservation, signed a Memorandum of Understanding (MOU) increasing their coordination to expedite and simplify building of transmission lines on Federal lands.

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[30] http://energy.gov/oe/services/electricity-policy-coordination-and-implementation/transmission-planning/recovery-act

[31] "Transmission Projects: At a Glance," (March 2014), http://www.eei.org/issuesandpolicy/transmission/Documents/Trans_Project_lowres_bookmarked.pdf.

[32] See http://energy.gov/oe/downloads/comments-received-proposed-rulemaking-regulation-implementing-section-216h-coordination

In 2010, the Obama Administration created a Rapid Response Team for Transmission, coordinated by the White House Council on Environmental Quality (CEQ) that consists of six cabinet level agencies, the Advisory Council on Historic Preservation, FERC, and CEQ. The Rapid Response Team for Transmission aims to improve the overall quality and timeliness of electric transmission infrastructure permitting, review, and consultation by the Federal government on both Federal and non-Federal lands through:

- Coordinating statutory permitting, review, and consultation schedules and processes among involved Federal and state agencies, as appropriate, through Integrated Federal Planning;
- Applying a uniform and consistent approach to consultations with Tribal governments; and,
- Resolving interagency conflicts and ensuring that all involved agencies are fully engaged and meeting timelines.[34]

The RRTT chose nine transmission projects in the federal permitting process as test cases to examine and find common improvements in agencies' permitting processes.[35] DOE operates an online dashboard to publicly track the permitting status of transmission line projects of these nine pilot projects and all transmission projects seeking federal permits and authorizations.

3. Oil and Natural Gas Transmission, Storage & Distribution Siting

The U.S. has an extensive network of pipelines to transport crude oil, liquids and CO_2 between producing areas, refineries and distribution centers. There are over 180,000 miles of liquid petroleum pipelines in the U.S.[38], delivering over 14 billion barrels of crude oil and petroleum product each year[39]. There are an estimated 30,000 to 40,000 miles[40] of crude oil gathering lines, located primarily in Texas, Oklahoma, Louisiana, Wyoming, and North Dakota, with small systems in a number of other oil producing states. These small lines gather the oil from many wells, both onshore and offshore, and connect to larger trunk lines. Trunk lines include a few large cross-country pipelines – typically 8-24 inches in diameter, but ranging up to the 48 inch diameter Trans Alaska Pipeline System (TAPS) - that bring crude oil from producing areas to refineries. There are approximately 57,000 miles of crude oil trunk lines in the U.S. with some crossing boundaries with Canada.

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[34] http://www.whitehouse.gov/administration/eop/ceq/initiatives/interagency-rapid-response-team-for-transmission
[35] Information on the nine pilot projects is at a DOE "dashboard" website at http://trackingsystem.nisc-llc.com/etrans/utility/Search.seam This site tracks not only tracks the nine pilot RRTT projects, but also a total of 27 (as of January 2014) proposed transmission projects that require multi-agency Federal permits.
[38] http://api.org/oil-and-natural-gas-overview/transporting-oil-and-natural-gas/pipeline/where-are-the-oil-pipelines
[39] http://aopl.org/aboutPipelines/
[40] http://www.pipeline101.com/Overview/crude-pl.html (likely more now, but need new data)

In addition to crude oil pipelines, there are also approximately 95,000 miles[41] (data may not reflect recent growth) of pipelines that carry refined petroleum products such as gasoline, jet fuel, home heating oil and diesel fuel to large fuel terminals or distribution centers, which is then typically loaded into tanker trucks for transport to the final point of sale.

Pipeline networks also include pump stations for crude oil and multi-products pipelines – which keep oil flowing at rates of 1 to 6 meters per second – and compressor stations for natural gas lines. "Pipeline expansion" projects often entail uprating of pumping capacity and only minimal, if any, alteration or extension to the pipe itself. Other ways to increase capacity and utilization of the system include reversing flow directions or converting gas into oil pipelines

U.S. refinery capacity is concentrated in traditional crude oil production areas (Texas, Oklahoma) or on the coasts where crude oil transported by tanker is readily accessible (California, Washington, New England, Gulf of Mexico). However, as increasing oil production from regions such as the Bakken shale deposits in North Dakota outstrips the ability of the pipeline developers and regulators to site new infrastructure, it has opened up a market for railroads to transport oil to refiners.

U.S. crude oil production has increased significantly in recent years - by a record 780,000 barrels per day in 2012[42]. This is largely through the proliferation of hydraulic fracturing, horizontal drilling and enhanced oil recovery (EOR) in the Eagle Ford formation and Permian Basin in Texas, and Williston Basin (Bakken formation) in North Dakota, but several other states have also increased production.[43]

Increased oil production in the U.S. has led to significant investments in new pipeline and rail infrastructure, changes in the direction of flows of crude oil and refined products, and new issues for state and federal infrastructure siting agencies.

Oil Pipeline Siting

For pipeline siting, the pipeline company decides on a general route they prefer for their proposed pipeline. Once they feel confident with the feasibility of their chosen route, the more formal process with various government agencies begins. That process is not consistent for all types of pipelines, but varies based on the type of pipeline and where it is to run.

There is no comprehensive federal permitting process for the routing of interstate oil pipelines. The responsibility for approval of the pipeline route falls on the individual states. If the state has no agency in charge of pipeline siting then the responsibility falls to the regular land use authority of local governments along the proposed route.

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[41] http://www.pipeline101.com/Overview/products-pl.html
[42] http://www.eia.gov/todayinenergy/detail.cfm?id=9530
[43] http://www.eia.gov/todayinenergy/detail.cfm?id=11351

Several states have agencies charged with siting various energy facilities. The state rules for pipeline routing vary significantly, from some states that identify avoidance and exclusion areas for new pipelines to some that allow the development of alternative routing, to other states that have no regulations at all for the location of new intrastate and interstate hazardous liquid lines.

Once a route has been settled on, the pipeline company has to obtain legal permission to cross each parcel of property along the route. This permission can be obtained by a voluntary purchase of an easement from the landowner, or by a court order under state eminent domain law. The use of eminent domain by pipeline companies can be controversial. [44]

Siting of Rail Lines

Rail is expanding to meet shipping demand from the North American oil boom. Most of the new infrastructure required is transloading terminals, which typically have short construction lead times of just 12-18 months. Rail fleet resources, like trains, additional track, and other facilities can be put in place quickly to handle rapid expansion.[45] The Surface Transportation Board created in the 1995 ICC Termination Act, regulates siting of rail lines. It has jurisdiction over railroad rate and service issues and rail restructuring transactions (mergers, line sales, line construction, and line abandonments).[46]

Natural Gas Pipeline Siting

The shale revolution has affected the entire natural gas industry and the broader economy, and has led to falling prices, expansion in the industrial and manufacturing sectors, lower imports (especially of LNG), and rapid increase in natural gas used to generate electric power. A major result of these developments is the substantial investment in new infrastructure. Previously released QER briefing memos for stakeholder meetings on natural gas TS&D, New England infrastructure constraints, and gas-electric interdependencies describe the effects of the shale revolution in greater depth.[47] The United States has a long history of executive branch rulemaking and congressional legislation with respect to natural gas transmission and distribution. The Natural Gas Act (NGA) of 1938 was the first federal law regulating the natural gas industry. This law has been variously updated and amended over the past eight decades. Congress gave the Federal Power Commission (FPC) (subsequently FERC) the authority to set "just and reasonable rates" for the transmission or sale of natural gas in interstate commerce. It also gave the FPC authority to approve construction and operation of facilities used in interstate

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[44] Pipeline Safety Trust: *Pipeline Safety New Voices Project, Briefing Paper #9*
[45] Carey, Julie M., Rail emerging as long-term North American crude option, Oil & Gas Journal, August 5, 2013 available at http://www.ogj.com/articles/print/volume-111/issue-8/transportation/rail-emerging-as-long-term-north-american.html (accessed on March 18, 2014).
[46] Surface Transportation Board http://www.stb.dot.gov/stb/about/overview.html
[47] See www.energy.gov/qer for these memos.

gas transmission. To authorize interstate transmission projects a certificate of public convenience and necessity is issued under Section 7 of the NGA.

Natural gas is transported by pipeline from the site of production to a refinery, and to its end destination for consumption. Recent growth in domestic natural gas production has led to an expansion of the natural gas pipeline system. There is still a significant pipeline capacity shortage between supply and demand centers for a number of regions in the country, such as New England.

Congress has granted FERC exclusive jurisdiction to regulate interstate natural gas pipelines. The Energy Policy Act of 2005 amended the Natural Gas Act to require FERC to coordinate the environmental review and the processing of all federal authorizations related to natural gas infrastructure with other agencies. FERC is now required to act as the lead agency for purposes of compliance with the National Environmental Policy Act. For instance, FERC sets the schedule for all permitting federal agencies (e.g. Fish and Wildlife Service and U.S. Army Corps of Engineers) to reach final decisions for authorizations necessary for natural gas infrastructure projects.

However, if a new intrastate natural gas pipeline construction project does not cross a state border, then the responsibility for approval of pipeline routes falls to the individual states. The permitting process for these pipelines varies from state to state and may involve many federal, state, and local stakeholders. Most states have more than one agency involved in pipeline siting.[48]

Federal agencies become involved in the intrastate natural gas pipeline permitting process if federally protected resources are affected by a project. For example, the Army Corps of Engineers becomes involved when a proposed pipeline will be constructed in an area with aquatic resources over which it has jurisdiction. The Fish and Wildlife Service (FWS) becomes involved if the route crosses an area with habitat for a protected species.

A Government Accountability Office (GAO) investigation of pipeline permitting found that

> "because permitting processes vary state by state, the time frames for those processes also vary. Comprehensive data on these processes is difficult to find. This is probably partially because most states do not have a lead agency that coordinates all the reviews necessary to complete the permitting process. For example, North Dakota state officials estimated that the siting part of the permitting process for intrastate pipelines takes just over 3 months; however, this does not include the time associated with any federal or state

[48] *GAO February 2013 Report: Pipeline Permitting Interstate and Intrastate Natural as Permitting Processes Include Multiple Steps, and Time Frames Vary (GAO-13-21)*

environmental reviews that may be necessary for pipeline projects. A New York state official estimated that the entire intrastate permitting process, including siting and all environmental reviews, takes 60 to 90 days for small pipelines, 3 to 6 months for medium pipelines, and 12 to 18 months for large pipelines. However, according to the official, these time frames vary depending on the complexity of the project and public opposition."[49]

4. Data Needs, Mitigation Methods and Tools for Siting and Permitting

The regulatory process for building and operating new pipelines, rail lines, crude oil rail terminals, electricity transmission lines and other energy infrastructure is in part designed to avoid or mitigate environmental impacts. Land use and environmental issues are frequently the most controversial issues debated when a new infrastructure project is proposed.

Improved technology and greater access to data about natural resources and wildlife habitat can also improve infrastructure siting and habitat preservation. For example, use of GIS habitat maps may help infrastructure developers avoid important wildlife habitats and improve the siting process.[51] The Western Governors Association recently created an online Crucial Habitat Assessment Tool (CHAT) for energy planners and state conservation agencies to bring greater predictability to planning efforts. CHAT is a GIS tool to identify and conserve wildlife habitats and migration corridors across the Western states. The project was supported by a Department of Energy grant in 2010.[52]

Where impacts to habitat or other natural resources are unavoidable, agencies involved in infrastructure siting decisions may require mitigation of those impacts. Wetlands provide essential habitat for wildlife, prevent flooding, and support outdoor recreation. The Clean Water Act of 1972 requires compensatory mitigation for filling wetlands. Subsequent amendments and executive orders established a federal policy requiring no net loss of wetlands, and replacement of wetlands impacted by construction projects with functionally equivalent wetlands. Mitigation banks were established to fund restoration or creation of wetlands to compensate for the loss of wetlands lost to new construction projects.[54]

Conservation banks are protected lands that are managed for the benefit of wildlife, including endangered or threatened species. The U.S. Fish and Wildlife Service approves credits for habitat or wildlife that conservation bank owners may sell to developers, to offset adverse impacts from

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[49] GAO February 2013 Report: Pipeline Permitting Interstate and Intrastate Natural as Permitting Processes Include Multiple Steps, and Time Frames Vary (GAO-13-21)
[51] Western Governors' CHAT available http://www.westgovchat.org/resources
[52] Western Governors' CHAT available at http://www.westgovchat.org/about
[54] National Mitigation Banking Association, History of Mitigation Banking, 2011, available at http://www.mitigationbanking.org/pdfs/HistoryOfMitigationBanking.pdf

a new development. Developers purchase credits to mitigate damage to habitat or wildlife from their project.[55]

5. Conclusion

Changing technology, changes in electricity markets and the oil and gas boom have led to huge infrastructure investments, with many more proposed for the near future. The Department of Energy is seeking stakeholder input for the QER Report on key questions concerning siting processes for energy transmission, storage and distribution infrastructure.

6. Key Questions

These and other questions will be considered during this meeting in Cheyenne and under the QER.

1. What is the relationship of regional planning processes and siting processes? Should regional transmission processes be given special weight in siting processes? How?
2. How do regional transmission planning processes reflect the potential addition of merchant transmission? Is there any difference in the way that regional (and inter-regional) planning processes evaluate transmission additions of merchant transmission lines versus lines developed by incumbent utilities? If there is a difference, does this have implications for siting - such as findings of "need."
3. Are there ways to improve federal and state regulatory jurisdictions and coordination? Is there a need to develop new roles and responsibilities or a more formal coordination process? Is there a need to make adjustment to jurisdictional boundaries?
4. Should the siting process by federal agencies evaluate the implications of transmission pricing on the need for transmission? Does the use of contract path transmission pricing affect the need for transmission? Does pricing based on contract path affect transmission capacity utilization? How?
5. Would it be beneficial to institute a national study on increasing the transfer capacity between the three regional interconnections - the Western Interconnection, the Eastern Interconnection, and the Texas Interconnection - based upon different business models?
6. What line segments are required to complete a national renewable energy backbone? Is a national study appropriate? What would the high level structure of such a study look like?
7. What are the data needs across the natural gas, liquid fuels and electricity sectors to enhance the siting processes for new energy infrastructure? Are there particular tools in

[55] National Mitigation Banking Association, Conservation Banking, 2011, available at http://www.mitigationbanking.org/pdfs/2010-conservationbanking.pdf

use at the local, state or regional level that would have applicability to the federal siting approval process?