

Natural Gas Pipeline Certification

Policy Considerations for a Changing Industry

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Acknowledgments

This report reviews the changing circumstances regarding the production, transportation, and consumption of natural gas in the United States and the potential impact of these changes on federal policies governing the certification and pricing of new interstate natural gas pipeline developments.

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I. Executive Summary

FERC's 1999 Policy Statement: Under Section 7(c) of the Natural Gas Act of 1938 (NGA), the Federal Energy Regulatory Commission (FERC, or Commission) has jurisdiction to review proposals to construct new infrastructure for interstate transportation of natural gas. FERC's authority spans issues related to the need for and location of the proposed facilities, the method and level of investment recovery, and the environmental impacts associated with a proposed project. FERC reviews proposals on a case-by-case basis in order to determine whether to issue a Certificate of Public Convenience and Necessity (Certificate, or CPCN) and, if so, whether to attach conditions on it. Once FERC has approved a proposed facility, the project developer may exercise eminent domain to acquire privately held land for the purpose of constructing and operating the facility.

For nearly two decades, FERC's assessment of gas-transportation proposals has been guided by its 1999 Statement of Policy (Policy Statement), which reflects the agency's consideration of gas industry issues and needs at the time the statement was issued. In the 1999 Policy Statement, FERC expressed its intention to ensure that its certification decisions would strike an appropriate balance between enhancing market competition and the potential for overbuilding natural gas infrastructure, with a focus on how to best balance public benefits, on the one hand, against potential adverse impacts to landowners, communities, and the environment, on the other.

In 1999 FERC sought to clarify its certification policy so that the Commission could better determine whether to issue a Certificate for interstate pipeline facilities.¹ FERC had concluded that in the context of changes leading up to 1999, such clarification was needed. The conditions at the time included:

- The relatively recent deregulation of upstream natural gas production and sales;
- The restructuring of the natural gas industry so as to encourage competition by unbundling and separating gas delivery transportation from commodity supply;
- The potential for competition among suppliers, potential deliverers, and potential users for use of capacity on the interstate system;
- The desire to create incentives for investment in and additions of new gas delivery capacity; and
- Anticipated continued growth in demand for natural gas.

Decades of significant change: Since 1999 FERC has approved approximately 400 pipeline applications for an additional 180 billion cubic feet per day (Bcf/d) of pipeline capacity. This amount of additional capacity on the interstate pipeline system is significant, considering that the average

In the 1999 Policy Statement, FERC stated its intention to ensure that its certification decisions would strike an appropriate balance between:

- enhancing market competition and supporting market demand
- avoiding the potential for overbuilding gas infrastructure and the potential adverse impacts to landowners, communities, and the environment.

Since 1999, FERC has approved virtually all of the hundreds of pipeline applications submitted to the agency.

¹ Statement of Policy, Certification of New Interstate Natural Gas Pipeline Facilities, Docket No. PL99-3-000; 88 FERC ¶ 61,227 (September 15, 1999), Order Clarifying Statement of Policy, Docket No. PL99-3-001, 90 FERC ¶ 61,128 (February 9, 2000), Order Further Clarifying Statement of Policy, Docket No. PL99-3-002, 92 FERC ¶ 61,094 (July 28, 2000) (hereafter "Policy Statement"), at 13-14.

consumption of natural gas in the U.S. during January 2017 was 93.1 Bcf/d, and the all-time peak-day consumption was 137 Bcf/d during the 2014 Polar Vortex.²

Significant changes have occurred in the patterns and pricing of the production, transportation, and use of natural gas in the nearly two decades since FERC issued its 1999 Policy Statement. Production and demand have increased substantially. Much of the new production in the past decade has taken place in parts of the country – like the Marcellus and Utica shale regions in the mid-Atlantic portion of the Appalachian Mountains, with the Utica region extending into the Midwest – that previously had been much less active in gas production and closer to many consumption regions in the Eastern states. Natural gas prices are relatively low. The power sector’s use of gas has increased significantly, in part due to the enormous quantity of gas-fired generating capacity added since 2000, the cost-competitiveness of producing power at efficient natural gas power plants, relative to many coal-fired power plants, and the flexible operational attributes of gas-fired generating capacity.³

Significant changes have occurred in the gas industry since 1999, including the addition of gas delivery capacity equivalent to double the average use of natural gas on a peak winter day.

Although there is interest in some regions to add pipeline capacity to alleviate wintertime gas-transportation constraints (and the pricing impacts that result),⁴ some industry observers are increasingly concerned about the potential to overbuild capacity on the interstate system in light of anticipated transitions in the nation’s energy system in the future.⁵ And there are growing questions about FERC’s balancing of public benefits versus adverse consequences in the context of case-by-case review of applications.

The past several years have also witnessed an acceleration of pipeline siting and certification challenges and concerted actions by affected landowners, neighboring homeowners, municipalities, environmental groups, and other interested parties. They are raising concerns about the potential adverse impacts and risks associated with siting new pipeline projects, especially given current and future trajectories of carbon and methane emissions from energy production, delivery and use. The associated increased use of hydraulic fracturing, or fracking, to extract gas to be transported by pipeline has also been a concern, given the health and safety risks of this relatively new gas-extraction technology.

Views on the need for more pipeline capacity vary – with some market participants interested in adding more pipelines to alleviate delivery constraints in some regions, and with other observers concerned about the potential to overbuild the system, given anticipated transitions in the nation’s energy systems.

² Energy Information Administration (EIA), “Natural Gas Monthly,” March 2017, https://www.eia.gov/naturalgas/monthly/archive/2017/2017_03/ngm_2017_03.php; EIA, “Record winter withdrawals create summer storage challenges,” June 12, 2014, https://www.eia.gov/naturalgas/review/winterlookback/2013/#tabs_Consumption-4.

³ EIA, “Electric Power Monthly,” September 2017, “Table 1.1 Net Generation by Energy Source: Total (All Sectors), 2007-July 2017,” https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_1_01.

⁴ M. Cusick, “Northeast needs more gas pipelines, says new report,” Pennsylvania State Impact, April 25, 2017, <https://stateimpact.npr.org/pennsylvania/2017/04/25/northeast-needs-more-gas-pipelines-says-new-report/>; A. Kovski, “Fast Growth Coming for Northeast Shale Gas Pipelines,” Bloomberg BNA, March 5, 2017, <https://www.bna.com/fast-growth-coming-n57982084782/>.

⁵ J. Shelor, “Marcellus/Utica On Pace for Pipeline Overbuild, Says Braziel,” Natural Gas Intelligence, June 8, 2016; <http://www.naturalgasintel.com/articles/106695-marcellusutica-on-pace-for-pipe-line-overbuild-says-brazil/>; J. Blum, “There is a risk of overbuild for Texas pipelines,” August 26, 2017, <http://www.houstonchronicle.com/business/energy/article/There-is-a-risk-for-an-overbuild-for-Texas-11969059.php>.

The degree of public participation in FERC’s meetings, hearings, and other proceedings has increased substantially. FERC’s decisions are subject to active litigation. Although in August 2017 courts upheld some FERC decisions, the Court of Appeals for the District of Columbia Circuit remanded FERC’s approval of three gas pipelines in the Southeast U.S. after finding that FERC should have provided more environmental information on the greenhouse gas (GHG) emissions that would result from burning the gas that the pipelines would carry.⁶

These many and complicated changes that have occurred since FERC’s 1999 Policy Statement warrant a fresh look at whether the approach adopted in that policy and applied in certification dockets since then still remains appropriate and, if not, what changes are now reasonable and necessary for FERC to fulfill its responsibilities under the Natural Gas Act. Changing industry conditions, combined with the principles espoused by FERC at the time of the last Policy Statement, support the conclusion that circumstances are now ripe for FERC to undertake a new and careful review of its policy guidance regarding pipeline certification.

Given the many and complicated changes that have occurred in the gas industry in the two decades since the 1999 Policy Statement, the time is ripe for FERC to take a fresh look at its policy guidance regarding pipeline certification.

Key Factors Warranting a Refresh of FERC’s 1999 Policy Statement: Here are the key factors that are driving the need for a refresh of FERC’s pipeline certification guidance:

- ***Significant industry changes led to adoption of the 1999 Policy Statement, but rapid industry changes and trends since then call into question the policy’s continued appropriateness.*** In 1999, FERC sought to clarify its certification policy so that the Commission could better determine whether to certificate interstate pipeline facilities. At that time, significant changes in the industry prompted FERC to review and clarify its policy: changes in regulation, market conditions, industry actors, and the nature of stakeholder concerns that were underway at that time. Since then, the degree of change in the gas industry – in gas production, delivery, and consumption, and in the level and character of local-government, landowner, and other stakeholder concerns and activism about gas production and delivery – has grown faster and more intensively than in the period preceding the 1999 review. The complexities of these issues and the inter-relationships among many of the post-1999 trends across the gas and electricity industries raise important questions about the continued appropriateness of FERC’s certification policy.
- ***A new, generic proceeding is a better forum than individual case dockets for addressing implications of wide-ranging industry changes and trends.*** Some of the trends described in this report suggest a need to apply the current FERC certification policy in different ways but still on a case-by-case basis; other trends support a need to shift the standards or information requirements

⁶ U.S. Court of Appeals for the District of Columbia, *Sierra Club et al. v. FERC*, No. 16-1329, decided August 22, 2017, [https://www.cadc.uscourts.gov/internet/opinions.nsf/2747D72C97BE12E285258184004D1D5F/\\$file/16-1329-1689670.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/2747D72C97BE12E285258184004D1D5F/$file/16-1329-1689670.pdf). The court found that FERC had not carried out its responsibility under the National Environmental Protection Act (NEPA) to prepare an adequate environmental impact statement (EIS). The D.C. Circuit also found that FERC violated NEPA a few years before the *Sierra Club* decision, when FERC failed to address various impacts related to a proposed project. U.S. Court of Appeals for the District of Columbia, *Delaware Riverkeeper v. FERC*, 753 F.3d 1304 (D.C. Cir. 2014).

that FERC uses to balance public benefit with adverse consequences, including reconsideration of how information is weighted in the balance. This stands as a compelling reason for why FERC should take a fresh look at its certification policy. For example, although the Policy Statement currently provides that the greater the adverse effect of a pipeline project, “the greater the showing of public benefits from the project required to balance the adverse impact,” individual FERC dockets and related litigation are not the ideal places for parties to hold conversations and inquiry about the scope of benefits and adverse consequences (and trade-offs) that should be undertaken by FERC in its reviews. This is the type of conclusion that FERC reached in deciding two decades ago to open inquiries into its certification policies for new natural gas facilities.

Dockets on individual pipeline proposals – where it is technically and procedurally challenging for non-technical people to provide meaningful input – are not the ideal place for parties to weigh in on the scope and distribution of benefits and adverse consequences that FERC should take into consideration in its reviews of project proposals.

Indeed, this is the very type of conclusion that FERC reached in deciding two decades ago to open inquiries into its certification policies for new natural gas facilities.

- ***The meaning and application of FERC goals have evolved over the decades.*** In the 1999 Policy Statement, FERC summarized that its goals in reviewing its pipeline certification process were to “foster competitive markets, protect captive customers, and avoid unnecessary environmental and community impacts while serving increasing demands for natural gas. It should also provide appropriate incentives for the optimal level of construction and efficient customer choices.” In 2017, these goals remain valid, but their meaning and application have evolved through a complex set of changes that have occurred in the larger energy industry and in natural gas markets in particular. The criteria guiding FERC’s determination of whether a proposal balances public benefits against potential adverse consequences deserve new attention.
- ***The interaction of gas and electric industries suggests a need for integrated assessment of both markets.*** Significantly, the interaction of the potential demand for new gas transmission capacity by local gas distribution companies (LDCs) and power plants complicates the assessment of market need and suggests the potential benefit of more structured and integrated assessments of market demand in pipeline certification cases. This is increasingly recognized in various regions – particularly in the Northeast U.S. – where the nearly exclusive winter LDC demand for natural gas for heating occurs alongside a rapidly growing dependence on gas to meet electric system reliability needs in both summer and winter. There and elsewhere, the availability of gas-transportation capacity during summer peak periods and the economic incentives embedded in market designs in many organized wholesale power markets to date have led to little demand for firm gas-transportation service by merchant power companies. This has introduced claims of power-system reliability challenges and opened the door to evaluations of economic alternatives to the development of new interstate pipeline capacity. These circumstances increase the complexity of natural gas “market need” assessments and point to the potential benefits in FERC certification reviews of considering regional and integrated evaluations of energy needs. A refresh is thus

warranted to enable FERC to “strike the proper balance between the enhancement of competitive alternatives and the possibility of over building” natural gas infrastructure.⁷

- ***Other factors originally highlighted in FERC’s 1999 Policy Statement remain important but warrant a reassessment in light of changes.*** Changes in the gas and electric industries and an increasingly active and oppositional context in which FERC’s pipeline certification cases occur indicate the need for review of factors FERC initially emphasized. These factors include:
 - the relevance and magnitude of pre-certification contractual commitments and/or precedent agreements;
 - the nature of relationships between pipeline developers and natural gas LDC, electric utility, and/or independent power producer affiliates;
 - the balancing of public benefits against adverse impacts in an era of debate over power system reliability implications and accelerating evidence of and concern over GHG emissions and climate-change risks resulting from current and future combustion of natural gas;
 - complications in assessing need and impacts across pipeline owners in an era of rapidly expanding changes and growth in production regions and consumption patterns; and
 - trade-offs across the interests of gas-consuming populations and those of communities impacted by gas infrastructure.

Given these many considerations, it is timely for FERC to look once again at the standards it will apply to future applications to construct new natural gas facilities. Opening a new docket to solicit comment on various issues would be an appropriate vehicle through which FERC could obtain broad public input and fresh consideration of the substantial recent and ongoing developments in energy industries and what changes in its certification policy may be appropriate and necessary in light of these transitions.

Given the important roles that natural gas resources play in the U.S. economy, the many changes underway in the energy systems that will likely affect future natural gas production, delivery, and use, and the importance of FERC administering its responsibilities under the Natural Gas Policy Act in a judicious manner, FERC should take a fresh look at the 1999 Policy Statement.

Such an inquiry would support the goal the Commission stated in 1999: “In considering the impact of new construction projects on existing pipelines, the Commission’s goal is to appropriately consider the enhancement of competitive transportation alternatives, the possibility of overbuilding, the avoidance of unnecessary disruption of the environment, and the unneeded exercise of eminent domain.”

⁷ Policy Statement, at 2.

Questions that FERC might consider in a review of its certification process include:

- Should FERC develop more prescriptive standards for reviewing applications for new pipelines, in light of the increasingly uncertain forecasts of the need for incremental pipeline capacity?
- Do changes underway in both the gas and electric industries – and the increasingly strong interrelationship between them – warrant a more integrated assessment of sectoral demand and electricity market forces in assessing natural gas pipeline need?
- Should FERC require regional planning regarding gas transportation resources similar to the regional planning requirement imposed on electric transmission owners?
- Should FERC apply a higher threshold standard and greater scrutiny with respect to demonstration of need, market demand, and public benefit where an affiliate (e.g., gas LDC, electric utility, and/or independent power producer) is involved in the proposed project?
- Should determination of need for a proposed pipeline project be the threshold determination (instead of the current threshold determination, which is whether the project could proceed without subsidies from existing customers)?
- Should FERC's balancing of benefits against adverse impacts be expanded to include noneconomic factors (e.g., should environmental impacts be among the adverse impacts FERC considers while applying the balancing test)?
- Should FERC give deference to state regulatory approvals (e.g., of contracts between pipeline companies and affiliated shippers including either local distribution companies or power plants) only when such approvals involve a regulatory review of whether such contracts represent the least-cost method of serving such demand, taking into account other strategies (e.g., energy efficiency in the case of an LDC contract, or dual-fuel capability at the power plant, or application of technologies to increase throughput on existing pipeline capacity)?
- Should FERC require a demonstration of need and public benefit based on a showing that non-pipeline alternatives have been considered as options to meet the demand of shippers (e.g., an integrated gas/electric resource plan or an integrated gas/electric reliability study, energy efficiency programs in the case of an LDC contract, dual-fuel capability at a power plant, or adoption and application of technologies to increase throughput on existing pipeline capacity)?
- Should FERC impose a greater burden to show that a pipeline is needed when it is proposed to gain market share rather than to meet new market demand?
- How should FERC's policy take into account the views of a variety of interested constituencies (including competitors, customers, landowners, local communities, and others affected directly and indirectly by the pipeline and by the impacts of gas combustion), many of whom may have limited access to resources to participate as full parties in specific pipeline-review cases?
- How should FERC weigh the relative distribution of benefits and burdens across those interested and affected constituencies?
- How should FERC take into account the potential for stranded costs of new pipeline capacity that is later determined to be no longer needed in light of changes in the nation's current and future energy mix?
- Should FERC consider new ways for pipeline applicants to internalize the long-term monetary and non-monetary risks associated with near-term capacity investment decisions?

II. Context: FERC's Policy Statement and Certification Process

FERC'S 1999 Policy Statement

Under Section 7(c) of the Natural Gas Act of 1938, FERC has jurisdiction over the review of proposals to construct new infrastructure for the interstate transportation of gas. In order for a company to site and construct a new facility (and to take land for the project through eminent domain), that company must receive a Certificate of Public Convenience and Necessity (CPCN) from FERC.⁸ (This is sometimes called FERC's "certification authority" or "Section 7(c) Certification Authority.") FERC reviews project proposals on a case-by-case basis to determine whether to issue a CPCN and, if so, whether to attach conditions to it.

On September 15, 1999, FERC issued a Statement of Policy regarding Certification of New Interstate Natural Gas Pipeline Facilities.⁹ This Policy Statement reflected FERC's review of extensive comments submitted by interested parties and its own experience in applying its certification authority in prior years.¹⁰ FERC had been exploring issues related to then-current policies on certification and pricing of pipeline projects in light of changes that had taken place in the industry leading up to the late 1990s. FERC stated that it sought to ensure that its policies would strike an appropriate balance between enhancing market competition and the potential for overbuilding natural gas infrastructure, with a focus on how to best balance market demand, on the one hand, against potential adverse impacts to landowners, communities, and the environment, on the other.

Leading up to the Policy Statement, FERC sought input on (among other things) several key natural gas policy issues in play at the time, including:¹¹

- Whether FERC should look in more detail at market conditions behind the contracts and/or precedent agreements included as evidence of market demand in CPCN cases;
- Whether it was appropriate for FERC to distinguish in its certification reviews between contracts or precedent agreements with affiliates versus non-affiliates, and/or to subject such proposals to a different or higher level of scrutiny;
- Whether FERC should allow rolled-in rate treatment for projects based largely on meeting the needs of a company's affiliate;¹²
- Whether it was appropriate for FERC to apply a different level or standard of review for proposals that were not for market expansion but were instead designed significantly or primarily to compete for market share currently met through existing infrastructure; and

⁸ 15 U.S.C. §717f(c).

⁹ Policy Statement.

¹⁰ Comments were submitted to FERC in response to a Notice of Proposed Rulemaking, Regulation of Short-Term Natural Gas Transportation Services, Docket No. RM98-10-00063 Fed. Reg. 42982, 84 FERC ¶ 61,087 (1998) and a Notice of Inquiry, Regulation of Interstate Natural Gas Transportation Services, Docket No. RM98-12-000, 63 Fed. Reg. 42974, 84 FERC ¶ 61,087 (July 29, 1998).

¹¹ Policy Statement, at 2-3.

¹² Rolled-in rate treatment for pipeline projects occurs when "the costs of an expansion are rolled into a pipeline's existing cost of service and rates are re-set accordingly." Regulatory Research Associates (RRA), "FERC and Natural Gas Pipeline Regulation – A Primer," May 27, 2016. By contrast, a non-rolled-in rate is one where the incremental costs of new pipeline projects are charged only to the users of the new facilities.

- Whether and how FERC might expedite applications that do not require eminent domain or that address landowner issues through developers' pre-filing activities.

FERC explained how its consideration of these issues was influenced by many factors: changes underway in the gas industry, challenges raised in evaluations of then-recent pipeline proposals, and the anticipated growth in demand for gas.¹³ The Commission recognized that it had not formally distinguished between projects that served new versus existing markets, or between projects that served affiliates versus non-affiliates.¹⁴ The Commission further noted that facility proposals had experienced increased objections by landowners and communities regarding the exercise of eminent domain to acquire land needed for the project.¹⁵ Finally, FERC wanted to consider the implications of increasing demand for gas, stemming from the deregulation of electric generation, the restructuring of the electric industry in many states in the 1990s, and the emergence of gas-fired combustion turbines and combined cycles as the technologies of choice for new electric generating capacity.¹⁶

Thus, FERC's purpose in issuing the 1999 Policy Statement was to review the changes underway in the gas industry and its user sectors, gather input from stakeholders, and develop an approach for reviewing requests for CPCN approvals that furthered the goals of FERC's regulatory policies, which included (1) fostering competitive markets, (2) protecting captive customers, (3) avoiding unnecessary environmental and community impacts while serving increasing demands for gas, and (4) providing appropriate incentives for the optimal level of construction and efficient customer choices.¹⁷

In the Policy Statement, the Commission identified the criteria that FERC would apply going forward to seek to balance the public benefits of new development against potential adverse consequences, in deciding whether to authorize the construction of major new pipeline infrastructure and grant a CPCN. The analytic steps identified by FERC included the following:¹⁸

- A certificate application would first undergo a threshold assessment of whether it would be able to proceed without any subsidies from the proponent's existing customers.
- Next, the application would be evaluated for whether the applicant had attempted to minimize adverse economic impacts on the customers of the developer, on other pipelines in the market or their captive customers, or on landowners affected by the pipeline route. This step was intended to motivate the applicant to mitigate any adverse effects before filing an application.
- In instances where a project would not have adverse economic impacts on the developer's customers, on other pipelines in the market or their captive customers, or on the economic interests of landowners or communities affected by the pipeline route, FERC would not need to apply a balancing of benefits against adverse effects.

¹³ Policy Statement, at 1-2.

¹⁴ Policy Statement, at 14-15.

¹⁵ Policy Statement, at 15.

¹⁶ See, e.g., P. Hibbard, S. Tierney, and K. Franklin, *Electricity Markets, Reliability and the Evolving U.S. Power System*, Section IV, June 2017, http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ag_markets_reliability_final_june_2017.pdf.

¹⁷ Policy Statement, at 13.

¹⁸ Policy Statement, at 18-19.

- But if such “residual” adverse economic effects *were* identified, the Commission would proceed to evaluate the project through a balancing test, weighing the evidence of public benefits against expected adverse effects. The Commission noted that this was primarily an economic test, and only where analysis indicated that economic benefits would outweigh adverse economic impacts would FERC then proceed to consider adverse environmental impacts.

FERC viewed the requirement that a project not include subsidization from existing ratepayers as addressing most of the potential adverse economic impacts, by requiring that a project be financially viable on its own given its costs, development challenges, and market interest.

For projects that required a balancing of benefits against adverse impacts, FERC said it would review all relevant factors related to the need for and benefits of the project, including precedent agreements, demand projections, estimated consumer cost savings, indications of access to supply, and whether the project was designed to meet new demand, to support electric grid and pipeline network reliability, and to advance clean air objectives.¹⁹ FERC clarified that it would focus on the balancing of economic interests with an eye toward fostering workable competition in the industry, but in ways that would not harm existing customers or provide incentives to overbuild. Additionally, FERC would continue to conduct a full NEPA review for each project.²⁰

The Policy Statement indicated that the amount of evidence required, and the categories of harm and benefit reviewed, would be determined on a case-by-case basis with a view toward proportional impact. While the Commission would not require that a specific percentage of a proposed project’s capacity be under commitments, FERC indicated that the filing of contracts would constitute significant evidence of demand for the project. FERC also noted that a proposal with multiple non-affiliate contracts might present a greater indication of need than a proposal backed only by a precedent agreement with an affiliate. FERC noted additional aspects of a proposal that could significantly expedite project approval, such as the acquisition of necessary rights of way without significant need for eminent domain, or a filing to meet new demand as opposed to adding to an existing market.²¹

Finally, FERC stated its expectation that developers would conduct a pre-filing process to identify and potentially address significant landholder and other stakeholder issues early in the process, so as to expedite FERC’s review. The process would include review of potential pipeline routes. Developers would initiate the process with a request to FERC approximately eight months prior to the filing of the formal certificate application.²²

¹⁹ Policy Statement, at 25.

²⁰ National Environmental Policy Act, 42 U.S.C. §4321 et seq. FERC is the designated lead agency coordinating NEPA compliance and other federal approvals in reviewing pipeline certificate applications. An Act to Ensure Jobs for Our Future with Secure, Affordable, and Reliable Energy, Pub. L. 109-58, 119 Stat. 594 (coded 42 U.S.C. 15801), Sec. 313.

²¹ Policy Statement, at 25-26.

²² P. Parfomak, “Interstate Natural Gas Pipelines: Process and Timing of FERC Permit Application Review,” Congressional Research Service, January 16, 2015 (hereafter “CRS 2015”), at 1-2.

The Certification Process

With that Policy Statement clarifying how FERC would exercise its certification authority going forward, FERC has subsequently reviewed pipeline applications through a formal certification process. As depicted in Figure 1, the process appears relatively linear, but in practice there are many instances where the developer files additional information in supplements at various points in the process, which complicates not only FERC's review but also various stakeholders' participation and ability to comment.

The process formally begins with an application to FERC for a CPCN under Section 7 of the NGA and FERC's certification regulations.²³ Among other things, the application must contain a description of the project, route maps and alternatives, construction plans, a list of all statutory and regulatory approvals required from other agencies, milestones and schedules, and various environmental reports studying potential impacts on the environment, cultural resources, land use, and other impacts.²⁴

Upon receiving a certificate filing, FERC issues a public notice and commences the application review process with a scoping of environmental issues.²⁵ FERC may issue a preliminary determination of need based on non-environmental factors and then begin the examination of the environmental impacts of the proposal in an Environmental Impact Statement (EIS) under NEPA.²⁶ Throughout, there are several opportunities for public input for both the environmental review and more generally.

Following its environmental review, FERC issues a draft EIS, which it finalizes after public comment. After issuing a final EIS, FERC makes a final determination on the certificate application. If granted, FERC's order states the terms and conditions of the approval, the approved pipeline route, and any required mitigation measures. FERC's certificate approval grants the developer eminent domain authority.²⁷ Parties may ask FERC to reconsider all or parts of its order, and if the rehearing period passes with continued FERC approval, FERC may issue a notice to proceed with construction activities.²⁸

²³ As noted above, approximately seven to eight months prior to submitting the formal certificate filing, a project developer may request to use FERC's pre-filing process to facilitate the certification and development process through pre-filing outreach with affected governmental entities and property owners, improvements in the certificate filing and investigation of impact-mitigation measures.

²⁴ CRS 2015, at 2-3.

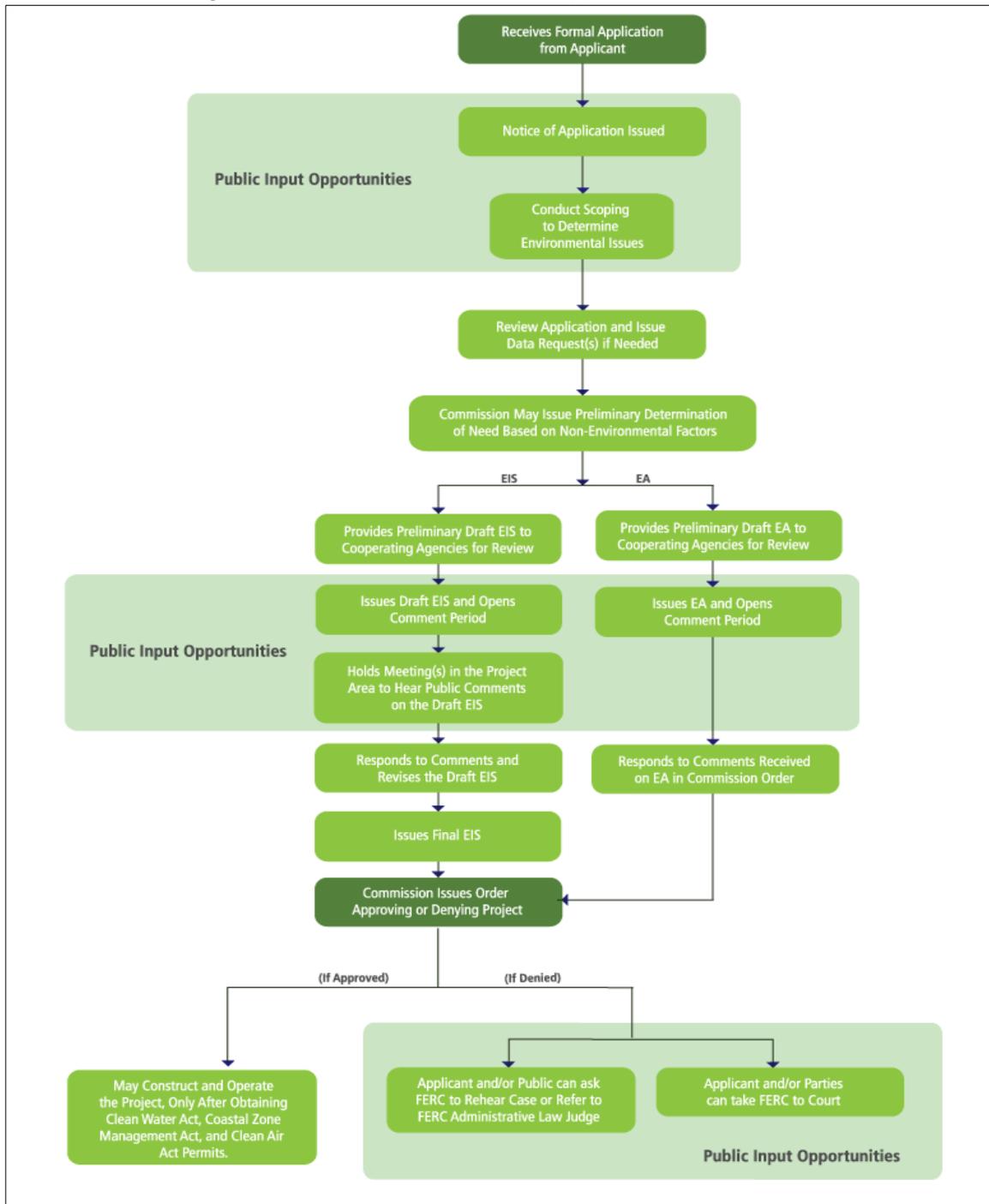
²⁵ FERC, "Processes for Natural Gas Certificates—Application Process" web page (hereafter "FERC web page"), <https://www.ferc.gov/resources/processes/flow/gas-2.asp>, accessed July 30, 2017.

²⁶ As shown in Figure 1, some projects may not need an EIS, if the agency with NEPA responsibilities for projects makes a finding in an Environmental Assessment (EA) that there is no significant impact on the environment.

²⁷ 15 U.S.C. §717f(h). Some have also deemed FERC's certificate approval as preempting state or local siting and zoning requirements. According to the Congressional Research Service, "[w]hen the pipeline company receives a certificate of public convenience and necessity from FERC, state or local laws that conflict with FERC's exercise of its jurisdiction under federal law or would pose an obstacle to construction of the pipeline (e.g., local zoning laws) are preempted unless FERC requires the company to comply with them as a condition of granting the certificate. The NGA specifically preserves state authority over pipeline projects under the federal Clean Air Act (CAA), Clean Water Act (CWA), and Coastal Zone Management Act (CZMA). However, state authority under these laws remains subject to federal administrative and judicial oversight and review." B. Murrill, "Pipeline Transportation of Natural Gas and Crude Oil: Federal and State Regulatory Authority," Congressional Research Service, March 28, 2016, Summary page. <https://fas.org/sgp/crs/misc/R44432.pdf>. However, some parties are contesting FERC's eminent-domain and preemption authorities: See, for example: M. Hand, "Landowners challenge pipeline developer, saying taking property is unconstitutional," Think Progress, July 28, 2017, <https://thinkprogress.org/landowners-file-lawsuit-over-use-of-eminent-domain-942679e7e040/>; M. Cusick, "Federal court rejects Constitution Pipeline's lawsuit against NY," StateImpact, August 18, 2017, <https://stateimpact.npr.org/pennsylvania/2017/08/18/federal-court-rejects-constitution-pipelines-lawsuit-against-ny/>.

²⁸ CRS 2015, at 5-6.

Figure 1: Overview of FERC Section 7(c) Certification Process



FERC web page.

Pipeline Certification Reviews

FERC has approved more than 400 pipeline applications since the 1999 Policy Statement, which led to approval of an additional 180 Bcf/d of capacity to the gas transportation system. Rejections of Section 7 applications have been the rare exception – only two rejections -- as described below.²⁹

Even while approving virtually all applications, FERC’s certification reviews have grown more substantial and complex over time, in part as a result of active participation by stakeholders in the application proceedings. These decisions have added detail to the agency’s application of the Policy Statement principles. In nearly all cases, however, FERC’s approvals of pipeline proposals have generally found that the following conditions have been met: (1) the project is financially supported by other than existing customers; (2) the project is needed, as demonstrated by contracts and/or precedent agreements indicating a prospective customer base; (3) the project will not adversely interfere with existing pipeline routes, customers, or markets; and/or (4) the project has taken steps to minimize identified adverse impacts on landowners and communities.

Various issues are typically raised through public comment, intervention in the proceedings or legal filings by individual or groups of landowners, states, localities, and various other stakeholders (such as local, regional, or national environmental organizations and business associations). For example, in its 2016 decision on the Florida Southeast Connection projects (sometimes called the Sabal Trail decision), FERC noted some parties’ concerns about potential conflict-of-interest issues associated with the projects’ investments to serve affiliated companies’ demand, but FERC found that an affiliation between project shippers and pipeline owners is not by itself evidence of self-dealing, from the perspective of project need determination.³⁰ FERC came to the same finding about self-dealing concerns raised with respect to affiliate long-term precedent agreements in the Constitution Pipeline case.³¹ And in a recent case (Atlantic Sunrise), FERC found that parties’ concerns about overbuilding of pipeline capacity in the Southeast were not a basis to turn down the certification application, and noted that current underutilization did not necessarily indicate low demand for capacity in the future.³²

While FERC has undertaken hundreds of pipeline certification reviews since issuing the 1999 Policy Statement, it has almost universally found project applicants to have sufficiently demonstrated need and/or benefits so as to warrant project approval under the principles and guidelines contained in the Policy Statement. In the two instances where FERC has rejected Section 7 proposals, FERC found the applicants had failed to show that the project’s public benefits outweighed its adverse impacts. For example, in its 2011 denial of the Turtle Bayou Gas Storage Company’s proposal to construct and

²⁹ As described further below, in 2011 FERC denied the application of the Turtle Bayou Gas Storage Company to construct and operate a natural gas storage facility in Texas (135 FERC ¶ 61,233 (2011)), and in 2016 FERC denied the application of Jordan Cove Energy Project to site, construct, and operate a liquefied natural gas (LNG) export terminal and associated facilities in Oregon along with the application of the Pacific Connector Gas Pipeline to connect the Jordan Cove LNG facility with the interstate pipeline system (154 FERC ¶ 61,190 (2016)).

³⁰ Florida Southeast Connection LLC, et al., 154 FERC ¶61,080 (2016), “Order Issuing Certificates and Approving Abandonment” (Docket Nos. CP14-554-000, CP15-16-000 and CP15-17-000). In this decision, FERC authorized three connected projects submitted by the Florida Southeast Connection, LLC, the Transcontinental Gas Pipe Line Company, LLC, and Sabal Trail Transmission, LLC.

³¹ Constitution Pipeline Company, LLC, and Iroquois Gas Transmission System, LP, 149 FERC ¶ 61,199 (2014), “Order Issuing Certificates and Approving Abandonment” (Docket Nos. CP13-499-000 and CP13-502-000).

³² Transcontinental Gas Pipe Line Company, LLC, 158 FERC ¶ 61,125 (2017), “Order Issuing Certificate” (Docket No. CP15-138-000).

operate a natural gas storage facility in Texas, FERC found that the applicant had failed to meet the criteria of the Policy Statement. No proposed pipeline capacity had been subscribed under any precedent agreements, the applicant failed to get rights to the sole landowner's land, and there was only a generally asserted need for gas storage.³³

More recently, FERC denied the application for the 232-mile Pacific Connector Pipeline, having found that the applicants "failed to demonstrate a need for the project sufficient to outweigh the potential harm to the economic interests of landowners whose property rights might be taken by exercise of the right of eminent domain....Pacific Connector had neither entered into any precedent agreements for its project, nor had it conducted an open season....The order found that the generalized allegations of need proffered by Pacific Connector did not outweigh the potential for adverse impact on landowners and communities."³⁴ In the same decision, FERC also rejected the proposed Jordan Cove Liquefied Natural Gas (LNG) Terminal because it was "an integral part of a single project [with the Pacific Connector] to export domestic gas supplies and the terminal project is not feasible without a pipeline to transport gas to the terminal."³⁵

Thus, in situations where FERC has determined that an applicant failed to demonstrate that the public benefits of a project outweigh its adverse impacts, FERC has rejected proposed projects. In the vast majority of cases, however, FERC has exercised its balancing test in a way that has led to project approvals. And in a recent 2-to-1 vote approving two pipelines in the same general vicinity, the commissioner voting against approval explained in a dissent her concerns that the pipelines would serve similar markets, that they would have significant adverse environmental impacts in the affected regions (especially when the combined impacts of the two pipelines were taken into consideration), that the record indicated there might be alternative approaches with significant environmental advantages over the pipelines' construction as proposed, and that a broader review of need (beyond precedent agreements) could help FERC better balance environmental impacts with project need and benefits.^{36,37}

³³ Turtle Bayou Gas Storage Company, LLC, 135 FERC ¶ 61,233 (2011), "Order Denying Application for Certificate Authorizations" (Docket No. CP10-481-000), with language quoted in Jordan Cove Energy Project, LP, and Pacific Connector Gas Pipeline, LP, 154 FERC ¶ 61,190 (2016), "Order Denying Applications for Certificate and Section 3 Authorization" (Docket No. CP13-483-000 and Docket No. CP 13-492-000).

³⁴ Jordan Cove Energy Project, LP, and Pacific Connector Gas Pipeline, LP, 157 FERC ¶ 61,194 (2016), "Order Denying Rehearing," Docket No. CP13-483-001 and Docket No. CP13-492-001 (hereafter "Jordan Cove Rehearing Order"), at 2.

³⁵ Jordan Cove Rehearing Order, at 3.

³⁶ These two pipelines are Atlantic Coast Pipeline, LLC, Dominion Transmission, Inc., Piedmont Natural Gas Company, Inc. 161 FERC ¶ 61,042 (2017), "Order Issuing Certificates" (Docket Nos. CP15-554-000, CP15-554-001, CP15-555-000, CP15-556-000); and Mountain Valley Pipeline, LLC, and Equitrans, LP, 161 FERC ¶ 61,043 (2017), "Order Issuing Certificates and Granting Abandonment Authority" (Docket Nos. CP16-10-000 and CP16-13-000).

³⁷ Commissioner Cheryl LaFleur's dissent in each docket stated, among other things, that: "Deciding whether a project is in the public interest requires a careful balancing of the need for the project and its environmental impacts. In the case of the ACP and MVP projects, my balancing determination was heavily influenced by similarities in their respective routes, impact, and timing. ACP and MVP are proposed to be built in the same region with certain segments located in close geographic proximity. Collectively, they represent approximately 900 miles of new gas pipeline infrastructure through West Virginia, Virginia and North Carolina, and will deliver 3.44 Bcf/d of natural gas to the Southeast. The record demonstrates that these two large projects will have similar, and significant, environmental impacts on the region....Both projects appear to be receiving gas from the same location, and both deliver gas that can reach some common destination markets. Moreover, these projects are being developed under similar development schedules....Given these similarities and overlapping issues, I believe it is appropriate to balance the collective environmental impacts of these projects on the Appalachian region against the economic need for the projects. In so doing, I am not persuaded that both of these projects as proposed are in the public interest. I am particularly troubled by the approval of these projects because I believe that the records demonstrate that there may be alternative approaches that could provide significant environmental advantages over their construction.... I believe that the needs determinations for these projects highlight another issue worthy of further

III. Factors Affecting FERC Certification Review Policies

FERC's issuance of its 1999 Policy Statement was closely tied to the changes underway in the natural gas industry at the time, as noted earlier. These changes included structural shifts in the industry, increasing challenges in the review of pipeline proposals, and the anticipated growth in natural gas demand.³⁸ Increased opposition to development proposals, complex market and pricing dynamics associated with increasing capacity, and the shifting of demand growth to electricity generation required a "refresh" of the Commission's evaluation of pipelines against the broader natural gas policy context.

As of the late 1990s, the industry had undergone major regulatory restructuring and deregulation for more than a decade. Drilling, exploration, and production were growing quickly, in large part due to the enactment and implementation of the Natural Gas Wellhead Decontrol Act of 1989, which deregulated gas production. The Fuel Use Act, which for a period of time had prevented natural gas from being used for many industrial and power-production applications, had by then been repealed.³⁹ FERC took steps over the 1980s and early 1990s to unbundle gas supply from gas-transportation and to assure that gas shippers had access to gas transportation capacity on a nondiscriminatory basis.⁴⁰ Deregulation of the natural gas industry had evolved significantly by the mid-1990s.⁴¹

Demand was also growing, driven by economic growth and the addition of new gas-fired generating capacity.⁴² A key concern at the time was limited transportation infrastructure after a decade of turbulence in the industry. These conditions were viewed particularly by the gas industry and many federal policy makers as necessitating expansion of the infrastructure needed to collect, store, import, and transport gas, and to serve new electric power demand growth with a unique pattern of peak demand needs (e.g., summer-peaking systems and competition with winter heating demand for capacity on the transportation system).⁴³ Infrastructure investment was deemed needed both to access frontier

discussion. The Commission's policy regarding evaluation of need, and the standard applied in these cases, is that precedent agreements generally are the best evidence for determining market need... I believe that careful consideration of a fuller record could help the Commission better balance environmental issues, including downstream impacts, with the project need and its benefits. I fully realize that a broader consideration of need would be a change in our existing practice, and I would support a generic proceeding to get input from the regulated community, and those impacted by pipelines, on how the Commission evaluates need." (Footnotes in the original are omitted here.)

³⁸ Policy Statement, at 1-2.

³⁹ Powerplant and Industrial Fuel Use Act of 1978, Pub. L. No. 95-620, 92 Stat. 3289. An Act to Repeal and Amend Certain Sections of the Powerplant and Industrial Fuel Use Act of 1978, Pub. L. 100-42, 101 Stat. 310.

⁴⁰ <https://www.ferc.gov/legal/maj-ord-reg/land-docs/restruct.asp>. Also, Rick Smead, "Price Instability in the U.S. Natural Gas Industry Historical Perspective and Overview," prepared for the Bipartisan Policy Center's Task Force on Natural Gas Market Stability, July 15, 2010, at 17-18, http://bipartisanpolicy.org/wp-content/uploads/sites/default/files/Introduction%20to%20North%20American%20Natural%20Gas%20Markets_0.pdf.

⁴¹ Many "industry observers mark the beginning of the deregulated era for the gas industry with the start of the spot market for natural gas. The genesis of the spot market for natural gas started with the large volumes of gas that were released as a result of the settlements between producers and pipelines over their gas supply contracts that occurred because of [FERC] Order 380 in 1984. [Order 380...eliminated gas costs from the pipeline minimum bill ... (and) in essence, enabled customers (i.e., LDCs) to break prior commitments with pipelines and shop for the least expensive gas supplies from other states. This represented a major change in the industry's structure and quickly changed contracting practices.] The combination of this 'released gas' and the declining demand at the time resulted in large volumes of excess supply (i.e., the 'gas bubble' or excess deliverability that lasted for about 15 years)." North American Electric Reliability Corporation (NERC), "A Primer of the Natural Gas and Electric Power Interdependency in the United States," December 2011 (hereafter "NERC Gas Primer"), at 7 and 8, http://www.nerc.com/files/gas_electric_interdependencies_phase_i.pdf.

⁴² National Petroleum Council (NPC), "Balancing Natural Gas Policy," September 2003, at 17.

⁴³ NPC, "Meeting the Challenges of the Nation's Growing Natural Gas Demand," 1999 (hereafter "NPC 1999"), at 10.

supply basin resources more distant from markets and to provide for distribution in more populous areas subject to more challenging siting and easement procedures and protests.^{44,45} The FERC Policy Statement was seen as necessary for and supportive of achieving needed natural gas infrastructure expansion.⁴⁶

Major Changes in the Natural Gas Industry Have Occurred Since the 1999 Policy Statement

The time is ripe for FERC to review its 1999 Policy Statement. There is strong reason for such a review, considering FERC's rationales in 1999 for evaluating its criteria for reviewing pipeline certification applications and for issuing the policy guidance, and also considering the significant changes that have occurred in the nearly two decades since 1999, including:

- substantial additions of pipeline capacity to transport natural gas,
- substantial growth in natural gas production,
- major locational shifts in natural gas production and pipeline capacity additions relative to demand,
- changes in the price of natural gas,
- growth in and changes in the pattern of demand in different sectors, and
- transformations in the character and levels of gas imports and exports.

Further, the circumstances surrounding FERC's assessment of need and the level of participation in proceedings to review pipeline development impacts have changed in fundamental ways.

This combination of changes has significantly altered the context for natural gas pipeline investment, siting and construction and the factors that FERC should be considering in pipeline certification cases.

Significant increases in approved pipeline certifications and pipeline capacity: In the first 10 years after FERC's issuance of the Policy Statement, there have been steady approvals of new pipeline capacity in the U.S. (See Figure 2 for FERC-approved applications since 1997, along with the amount of pipeline capacity reflected in those FERC approvals, by year.) From 2000 through 2004, pipeline companies received approvals to add between 2 and 9 Bcf/d of gas transportation capacity each year.⁴⁷ During the next five years, capacity approvals increased even more, averaging more than 17 Bcf/d of capacity additions each year from 2005 through 2009. (Figure 2 shows capacity associated with FERC approvals in MMcf/d, with 1,000 MMcf/d equaling 1 Bcf/d.)

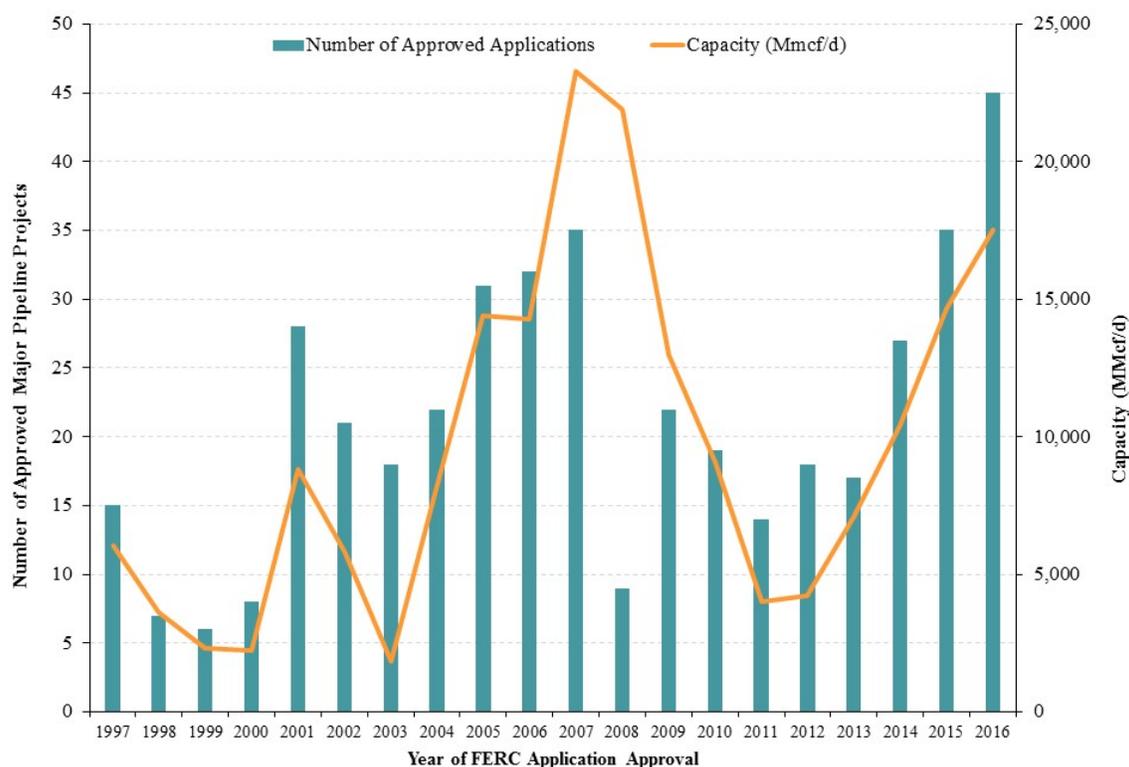
⁴⁴ NPC 1999, at 48.

⁴⁵ NPC, "Prudent Development: Realizing the Potential of North America's Abundant Natural Gas and Oil Resources," 2011 (hereafter "NPC 2011"), at 52.

⁴⁶ NPC 2011, at 52.

⁴⁷ Given limitations in the publicly available time series data that summarize gas-delivery capacity approval and additions in a consistent fashion, this discussion of capacity additions has been broken into two time periods: 2000-2004 and 2005-2009.

Figure 2: Approved Major U.S. Pipeline Projects (Number) vs. Capacity Added (MMcf/d) (1997-2016)



Note: Chart includes approved pipeline applications and those projects' associated capacity additions in the year of application approval. This does not represent capacity in service, or capacity coming online in any given year.

Source: FERC.

There was a drop-off in applications in 2008, reflecting the impact of the recession as well as the existence of high natural gas prices in the previous few years, which dampened demand and interest in adding new gas transportation capacity. Pipeline certification applications picked up considerably with the emergence of shale gas and declining gas prices in the post-2008 period.

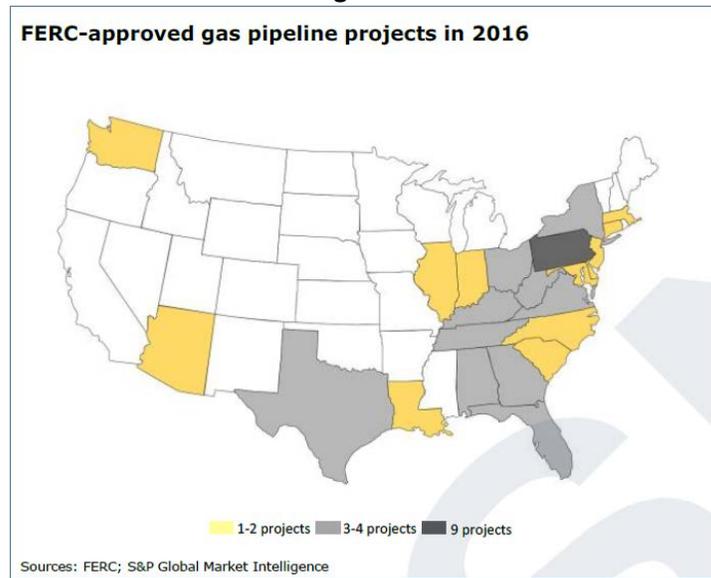
From 2007 through 2016 alone, FERC approved 234 gas pipeline projects, more than half the number approved since the Policy Statement was issued in 1999. These projects amounted to 121 Bcf/d in total incremental capacity approvals, with 10,250 miles of pipe estimated to cost approximately \$51.2 billion. For context, average use of natural gas during 2016 was 75.11 Bcf/d, and average daily use during a month with seasonally high use of gas (January 2017) was 93.1 Bcf/day.⁴⁸

The impact of shale gas on development of pipeline capacity in the past decade has been significant: In 2016 alone, pipeline approvals were geographically concentrated in the Marcellus region in Pennsylvania and other parts of Appalachia, where (as described further below) gas production has increased dramatically in recent years.⁴⁹ See Figure 3.

⁴⁸ EIA, "Natural Gas Monthly," March 2017 (for January 2017); and EIA, "Short Term Energy Outlook," September 2017, Table 5a, "U.S. Natural Gas Supply, Consumption, and Inventories."

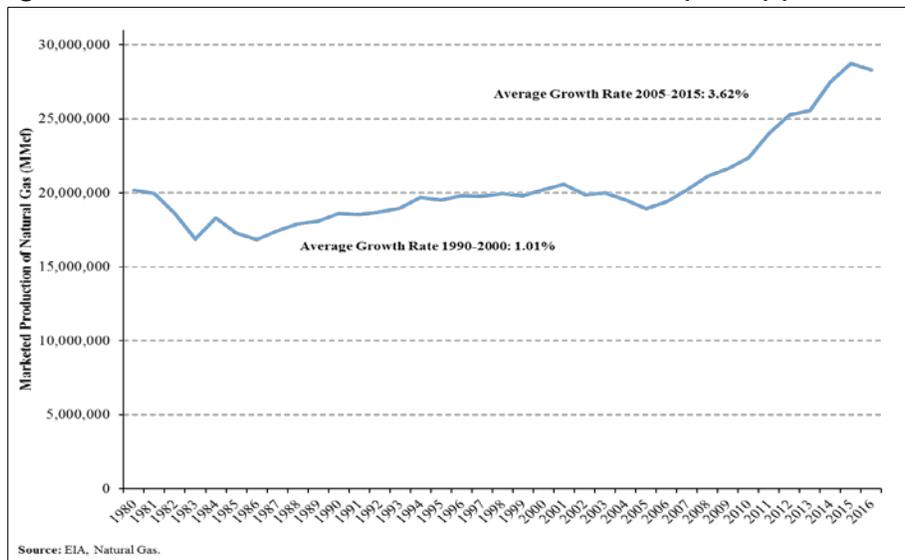
⁴⁹ RRA, "An Overview of FERC Approval of Natural Gas Pipeline Projects from 2007–2016," March 9, 2017.

Figure 3:



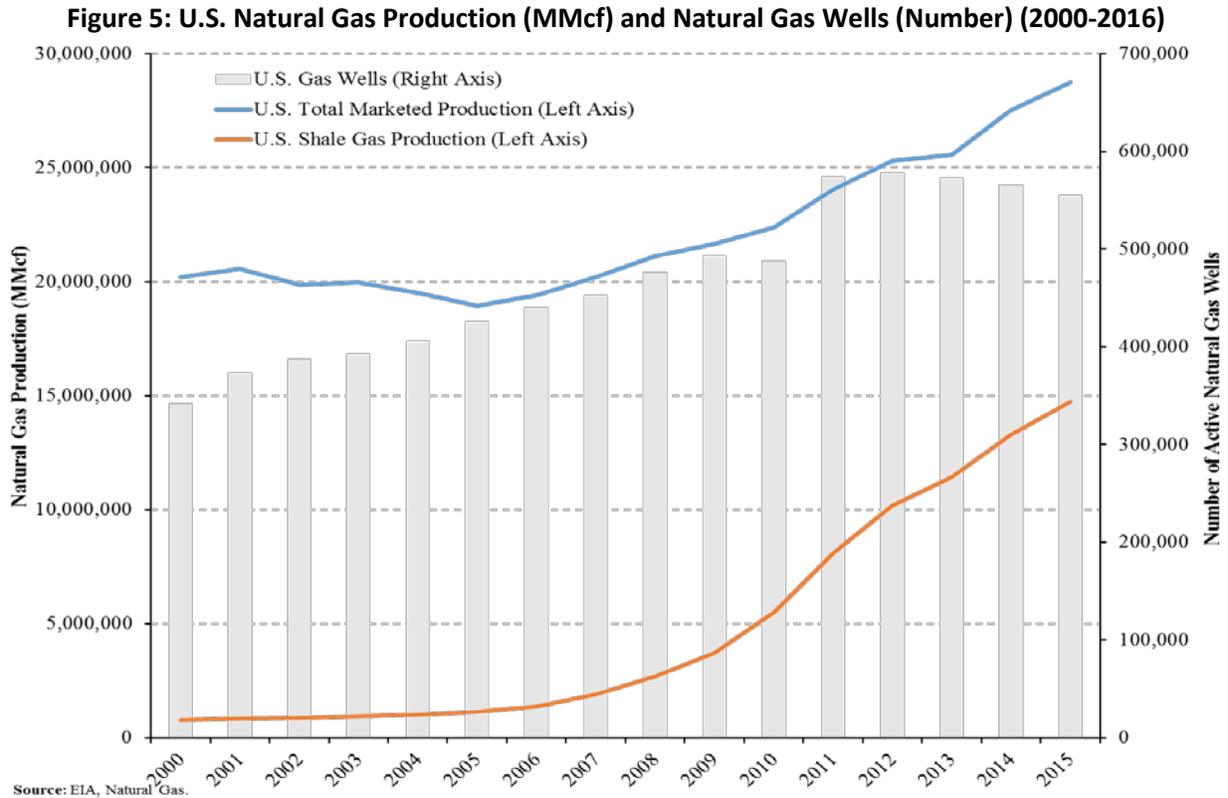
Substantial growth in natural gas production: U.S. gas production has grown significantly in the years since FERC’s Policy Statement. Growth in domestic production accelerated in particular in the decade following the emergence of shale gas in the U.S. around 2006–2008. As shown in Figure 4, average annual growth in marketed domestic production of natural gas was just over 1 percent per year from 1990 to 2000; from 2005 to 2015 the growth rate was 3.6 percent per year on average. Between the mid-1980s and the mid-1990s, marketed natural gas production levels grew from around 17 trillion cubic feet (Tcf) annually to just over 20 Tcf; by contrast, between 2005 and 2015, output averaged nearly 28 Tcf. This new high represented a 65-percent increase from the levels of the mid-1980s. (Note that 1 Tcf equals 1,000 Bcf, or 1,000,000 MMcf of natural gas.)

Figure 4: U.S. Total Marketed Production of Natural Gas (MMcf) (1980-2016)



Changing location of natural gas production changes location of pipeline capacity additions:

The dramatic increase in natural gas production since the mid-2000s is fundamentally due to the large and rapid growth in shale gas production.⁵⁰ Figure 5 compares marketed natural gas production (from Figure 4) with the annual trends in U.S. shale gas production and the total number of gas wells in the United States. As shown, the increase in overall gas production is directly due to the nearly 12 Tcf increase in shale gas production from 2005 through 2015.



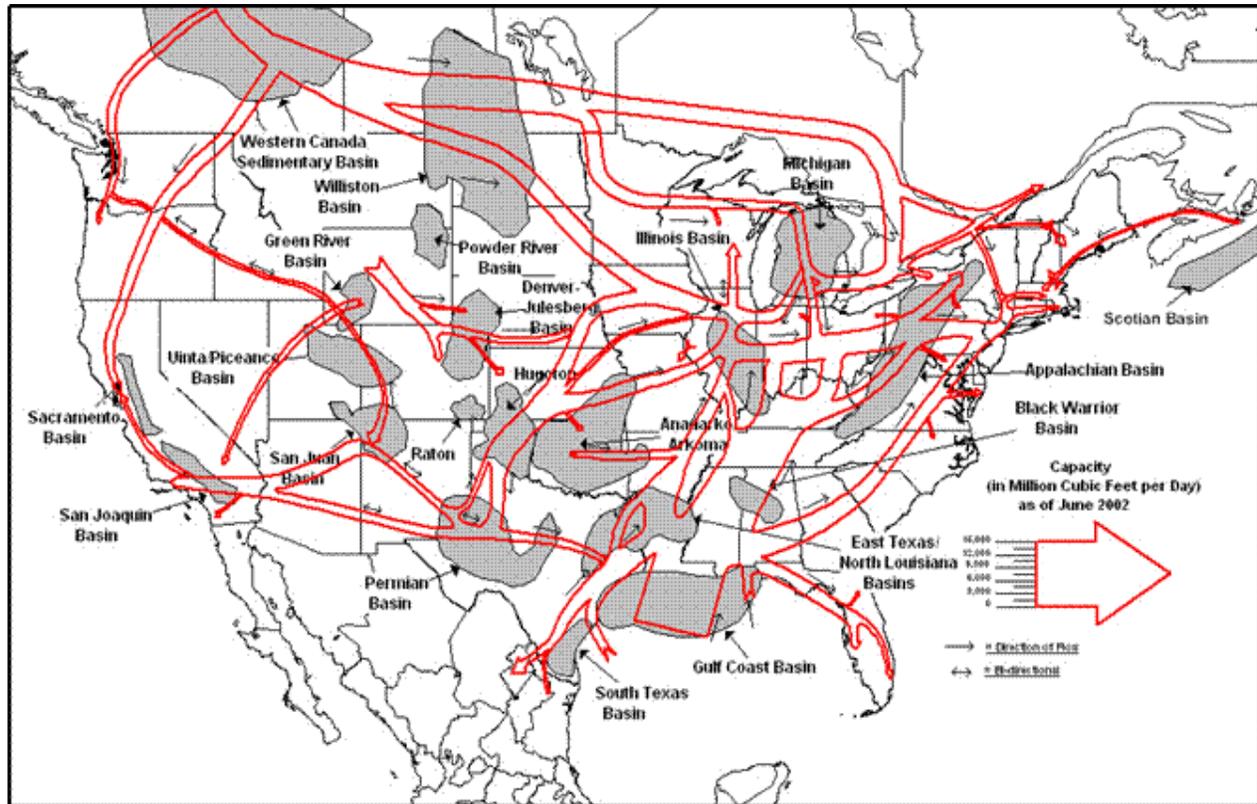
This increase in shale gas production has changed the geographic locus of domestic production, shifted the flows on the interstate pipeline network (changing the nature of market demand and impacts on competitors), and dramatically altered the nature of U.S. imports/exports of natural gas. Historically, domestic gas production occurred in Texas and the adjacent Southwest and Gulf Coast states, with major interstate pipelines emanating from those regions and connecting to gas-consuming regions elsewhere. This has changed since the conditions that existed in 1999, when FERC issued its Policy Statement.

Figure 6 depicts the volume and direction of flows (outlined in red pathways) on the gas transportation system as of 2008, with production basins indicated in the background. On the map, the

⁵⁰ EIA, "Marcellus, Utica provide 85% of U.S. Shale Gas Production Growth Since Start of 2012," *Today In Energy*, July 28, 2015 (hereafter "EIA Marcellus/Utica"), <https://www.eia.gov/todayinenergy/detail.php?id=22252>.

width of the red pathways indicates the capacity to move gas away from a production region. By far, the region with the most transportation capacity a decade ago was the Gulf Coast.

Figure 6: U.S. Natural Gas Pipeline Systems as of 2008



Source: Energy Information Administration, Office of Oil and Gas, Natural Gas Division, Gas Transportation Information System

https://commons.wikimedia.org/wiki/File:Map_US_Natural_Gas.gif⁵¹

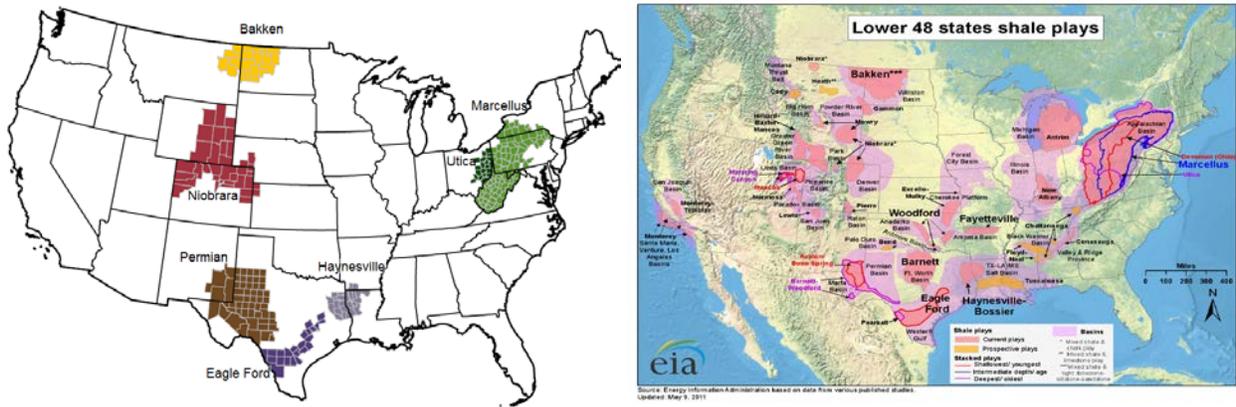
Although production of natural gas is still strong in the Gulf region (and elsewhere), the location of incremental production has changed in the past decade. Figure 7 shows the many shale-gas-producing regions in the U.S. But, as shown in Figure 8, production in the Marcellus and Utica regions in the Mid-Atlantic and Northeast regions has grown nearly 13-fold from 2010 to 2017 alone and has been the primary source of shale gas in the U.S. An EIA study found that the Marcellus and Utica shales constituted 85 percent of the overall increase in natural gas production since 2012.⁵² Even as shale gas development in the Mid-Atlantic states has dominated market dynamics in the Northeast, the traditional Permian/Eagle Ford/Haynesville basins in the Gulf Coast region have still led in production of natural gas in the U.S. as a whole.⁵³ (See Figure 9.)

⁵¹ EIA’s website did not include this archived version of the 2008 flows on the gas-pipeline system, necessitating reliance upon this source.

⁵² EIA Marcellus/Utica.

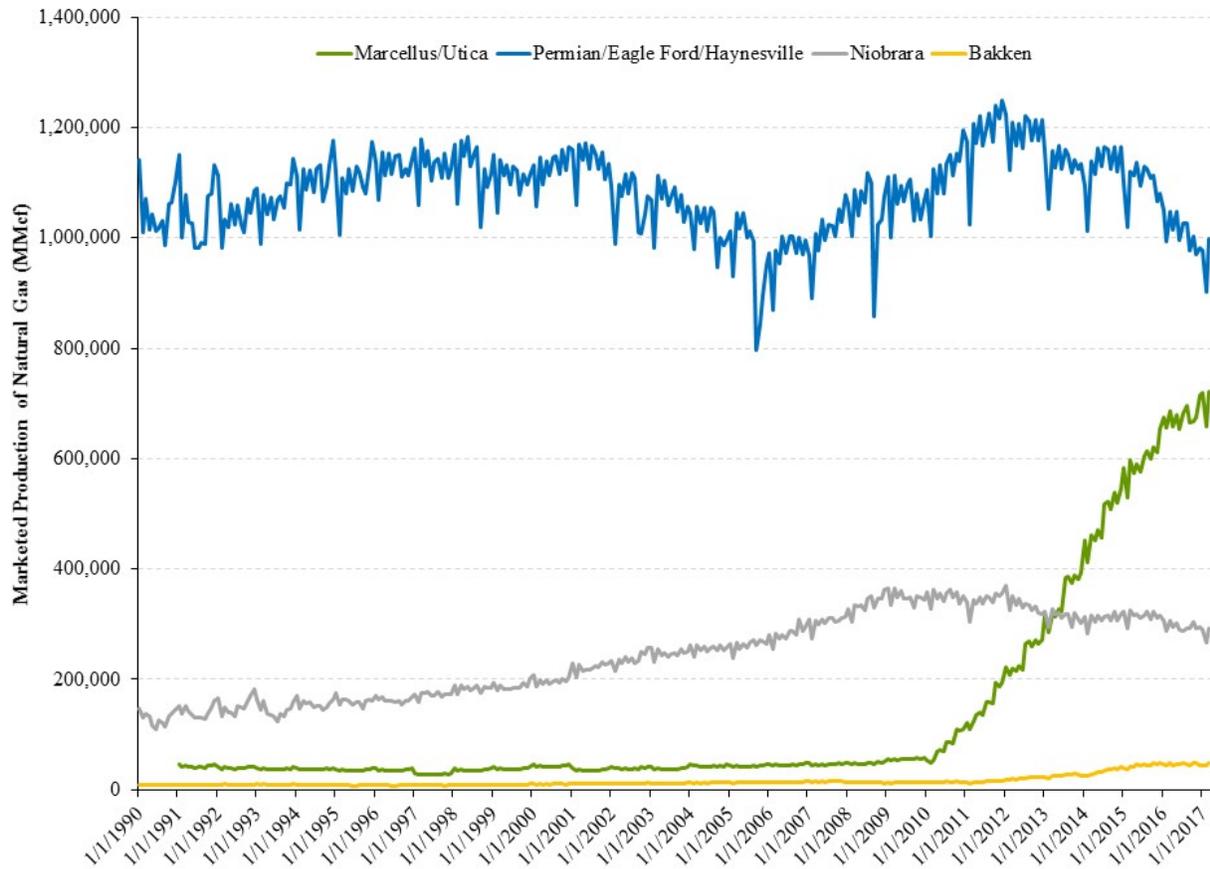
⁵³ Shale gas production in the Permian Basin region has flattened off at about 400,000 to 500,000 MMcf per year, whereas the production levels in Marcellus/Utica/Antrim region continue to rise. See Figure 9 for annual production of shale gas only.

Figure 7: Shale-Gas Producing Regions and Shale Plays

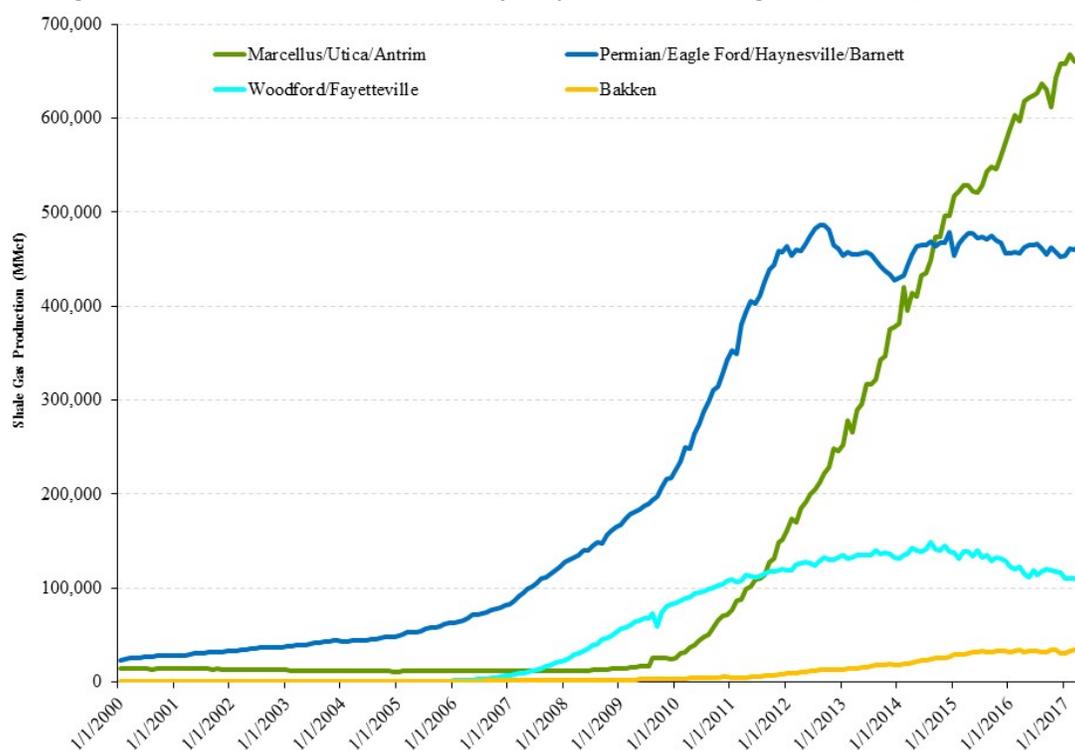


Source: EIA for both maps

Figure 8: U.S. Marketed Production of Natural Gas by Major Gas Region (MMcf) (1990-2017)



Source: EIA, Natural Gas data.

Figure 9: U.S. Shale Gas Production by Major Shale Gas Region (MMcf) (2000-2017)

Note: Only shale gas production is included.
Source: EIA, Natural Gas data

The growth in shale gas production in nontraditional gas-producing regions in the U.S., the associated changes in production in traditional regions and the changes in U.S. imports and exports of natural gas have strongly affected the quantity, location and purpose of pipeline development and use in the past decade.

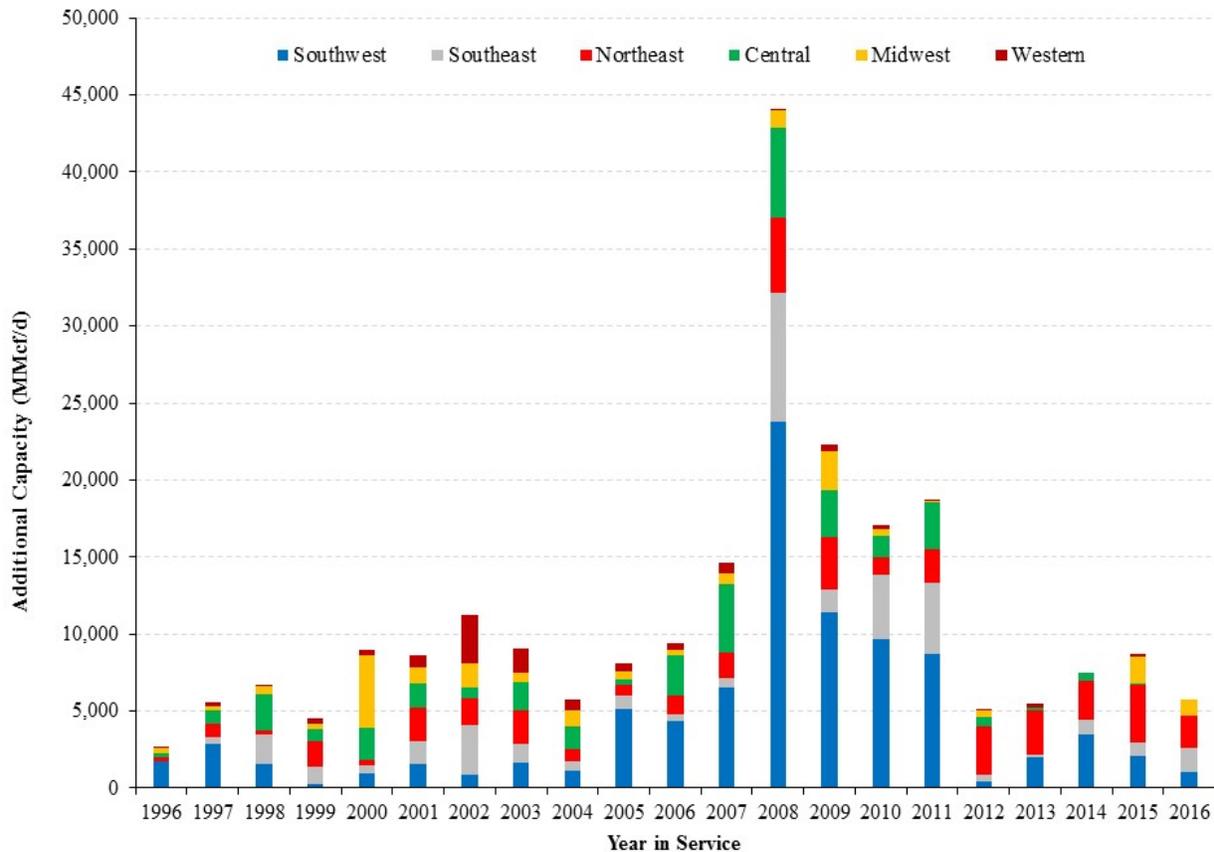
Figure 10 shows the actual annual U.S. gas pipeline capacity additions (by the year in which the pipeline capacity entered commercial service) over the past 20 years, by region.⁵⁴ Growth in pipeline capacity additions was greatest in the mid-2000s, with just under 118 Bcf/day of capacity added from 2007 through 2011. Given the land-acquisition/engineering/construction period that follows upon a FERC approval, these capacity additions reflect applications originally submitted to and/or approved by FERC in the few years preceding the year in which capacity was added. (The spike in capacity coming on line in 2008 reflects the high level of pipeline capacity in the many dozen FERC applications approved in the few years before 2008.⁵⁵) The capacity that entered service from 2007 through 2011 was more than

⁵⁴ According to definitions of the EIA, the Northeast region includes ME, NH, VT, MA, RI, CT, NY, PA, NJ, WV, VA, MD, DE, and DC; the Southeast region includes KY, TN, NC, SC, GA, AL, MS, and FL; the Midwest region includes OH, MI, IN, IL, WI, and MN; the Central region includes MO, IA, KS, NE, SD, ND, MT, WY, CO, and UT; and the Southwest region includes LA, AR, TX, OK, and NM. For the purposes of the chart, pipelines located exclusively in the Gulf of Mexico have been included in the Southwest region. The West region includes AZ, CA, NV, ID, OR, and WA (and, for purposes of the chart, Alaskan pipelines have been included in the West).

⁵⁵ In Figure 2, the annual amounts of capacity reflect the Bcf/d associated with the FERC-approved applications in a particular year. In Figure 10, the amounts of capacity reflect the year the pipeline project finished construction and entered commercial operations.

half of all capacity additions between 2000 and 2016. These additions, particularly in the past decade, occurred primarily in the Northeast, where the majority of incremental shale-gas production occurred and where there are active markets for incremental gas supply. This is particularly true since 2012.

Figure 10: U.S. Natural Gas Annual Transmission Pipeline Capacity Additions by Region (1996-2016)



Note: Chart includes capacity added by year in service. This is different from Figure 2 in that Figure 2 displays capacity additions by year of FERC application approval.

Source: EIA.

The current U.S. pipeline system reflects the effect of this incremental pipeline capacity addition. Figure 11 (on the left) shows the pipeline system as it existed as of 2009, with the Southwest/Gulf Coast area representing a significant concentration of pipeline infrastructure. By 2016, the capacity in that region still represents a major share of the nation’s total, but the additions in the Northeast now account for an increased share of total capacity on the interstate system.

Figure 12: Monthly Average Henry Hub Natural Gas Spot Price (\$/MMBtu) and Marketed Gas Production (MMcf) (1997-2017)

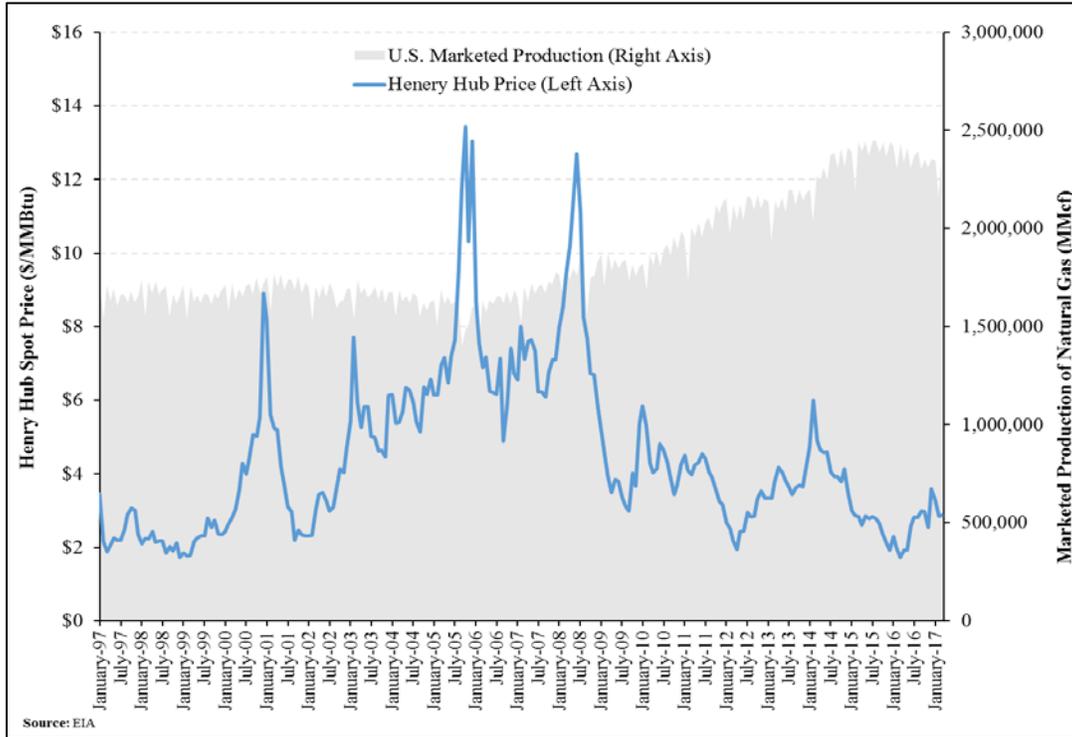
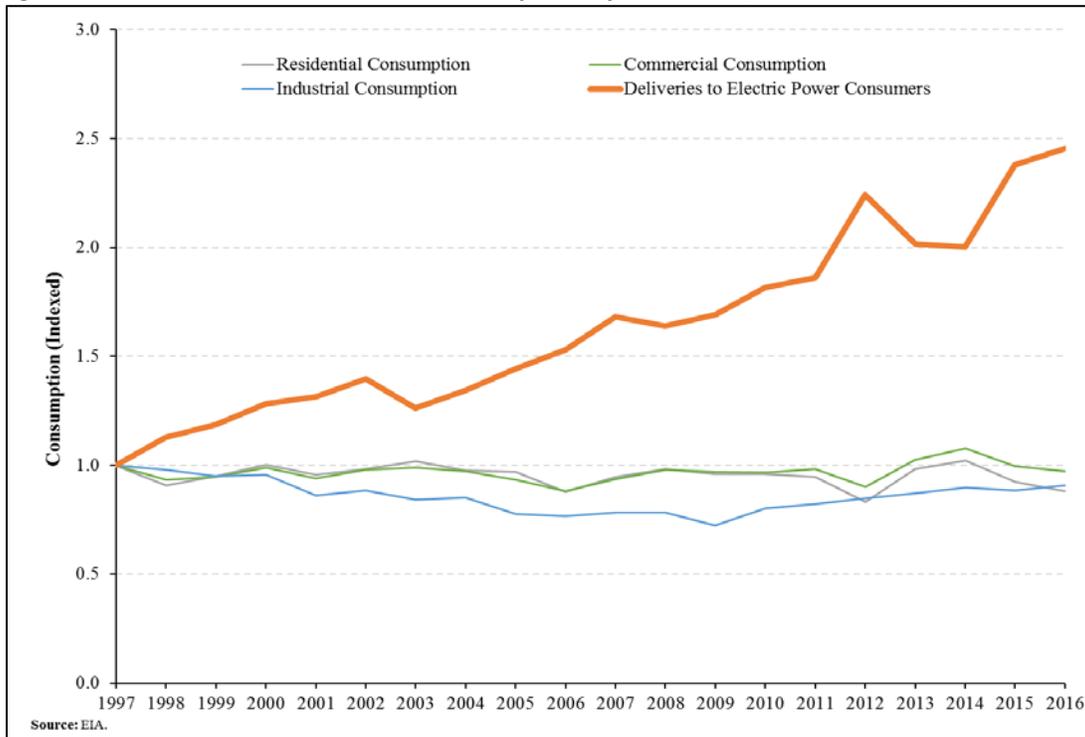


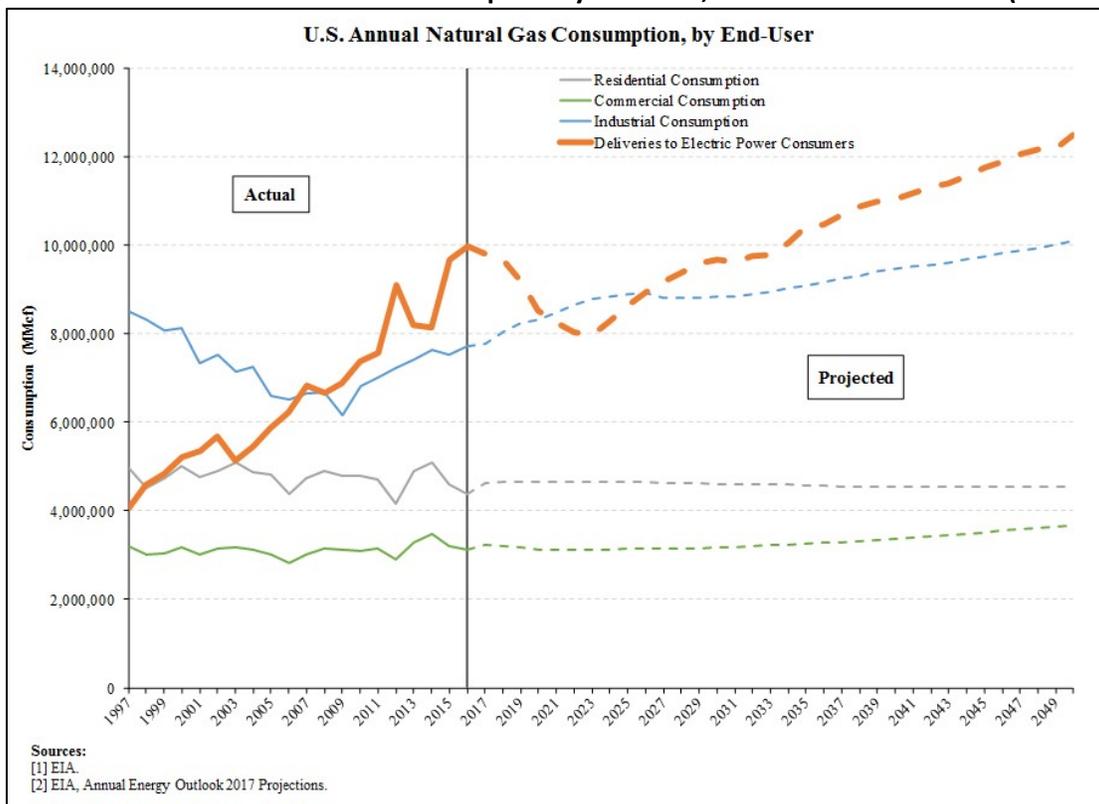
Figure 13: U.S. Annual Natural Gas Consumption by End User (Indexed to 1997) (1997-2016)



EIA projects that this trend will continue in future decades (in the absence of new policies, which is a core assumption in EIA’s long-term forecasts).⁶⁰ EIA estimates that gas used for power generation will grow substantially, well outpacing the use of gas in the residential and commercial sectors (anticipated to remain relatively flat), and even ahead of growth in consumption in the industrial sector (estimated to see modest increases in gas use). (See Figure 14.)

This outlook for greater use of gas for power generation adds uncertainty to the usage patterns on the interstate gas-pipeline system. Power plants have patterns of output that vary by season, with peak demand for generation during the summer months, when capacity to move gas is generally available, and with a second but lower peak during winter months, when there may be greater competition for access to existing pipeline capacity in different parts of the pipeline system. Even as the power sector is expected to increase its demand for natural gas, the electric system is evolving rapidly with the entry of more renewable resources, which will affect patterns of output at gas-fired power plants. These factors, combined with additional production of shale gas in the Marcellus and Utica regions, could create a more dynamic landscape of continually shifting and unpredictable flows on the interstate gas pipeline system.

Figure 14: U.S. Annual Natural Gas Consumption by End User, Actual and EIA Forecast (1997-2050)

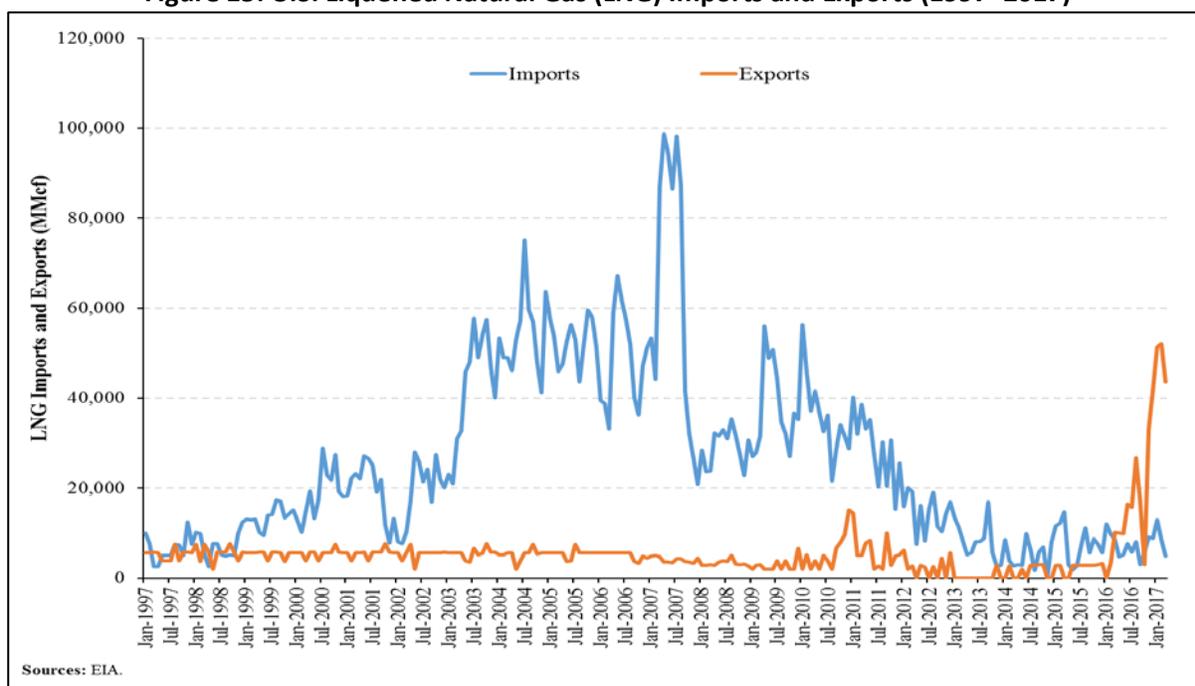


⁶⁰ EIA, *Annual Energy Outlook 2017*, January 2017, <https://www.eia.gov/outlooks/aeo/>.

These changing circumstances in the market for natural gas point to the need to examine these dynamics quite explicitly as part of reviews of proposed pipeline additions.

From imports to exports of natural gas: Despite increased demand from the electric power sector, production in the U.S. has grown so substantially that there is now a surplus of natural gas (i.e., higher levels of gas production than consumption in the U.S.). The excess supply is a reversal of the nation's historical posture as a net importer of natural gas.⁶¹ Figure 15 shows this transformation over the past 20 years. Natural gas imports (especially in the form of LNG) spiked in the mid-2000s, but as production has increased, imports have declined and exports have grown substantially over the past two years.

Figure 15: U.S. Liquefied Natural Gas (LNG) Imports and Exports (1997–2017)



Other Changes Affecting the U.S. Energy System Have Occurred Since 1999

Many other changes have also taken place since 1999 and have altered the context in which gas-transportation facilities come before FERC for a certification review. These changes, in combination with the fundamental shifts in the natural gas industry discussed above, provide a strong rationale for FERC to evaluate the guidance contained in its 1999 Policy Statement, with an eye toward evolving it to ensure its relevance in certification proceedings over the next decade.

Changes for FERC to consider include near-term transitions in the electric system that are likely

⁶¹ EIA, "United States Expected to Become a Net Exporter of Natural Gas This Year," *Today in Energy*, August 9, 2017, <https://www.eia.gov/todayinenergy/detail.php?id=32412>.

to affect the role of gas for power supply; increasing opposition to natural gas infrastructure; changes in the state of climate science; impacts from climate change; and potential longer-term transitions in the nation's energy portfolio as discussed in deep-decarbonization analyses.⁶² As described further below, these changes introduce countervailing pressures with respect to the incremental need for gas-delivery capacity additions and raise questions about how various types of impacts of such facilities and systems might affect the need for and risks associated with new pipeline capacity additions in the near term and the long run.

Although FERC is not an environmental regulator, the Commission's exercise of its certification authority introduces environmental issues into its reviews, in terms of both public benefits and adverse impacts. Increasingly, local, regional and even global impacts associated with use of natural gas as an energy resource are introduced into Section 7 facility reviews. Moreover, FERC is required to address environmental impacts pursuant to its obligations under NEPA.⁶³

While FERC's jurisdiction over the environmental impacts of energy production and use may be limited, these issues will undoubtedly continue to be part of the agency's review of proposed new gas infrastructure and will influence the quantity and nature of pipeline-certification reviews going forward. This seemed clear even before the recent decision of the D.C. Circuit Court of Appeals on the need for FERC to review the environmental impacts of the use of natural gas transported across Section 7 facilities.⁶⁴ It is now even more certain.

For this reason, this paper reviews the many changes that have occurred since 1999 in the nation's electric system, in public attitudes about siting energy facilities, in what is known about the changing climate, and in what is anticipated with respect to a much lower-carbon energy portfolio in the future.

Transitions in the U.S. electric system: The nation's electric system is in the midst of a major transformation, one that has already affected the demand for natural gas and for facilities covered by FERC's certification authority in recent years.⁶⁵ Among the many changes that have occurred since 1999:

- significant additions of gas-fired and renewable-energy generating capacity (see Figure 16);

⁶² There is a growing body of literature on the need to decarbonize the nation's energy systems in order to address the worst impacts of climate change. This literature assumes not only that in order to meet the targets for GHG-emission reductions consistent with a 2°C maximum change in average global temperatures adopted in the Paris Climate Accord, it will be necessary to reduce emissions in the power sector, but also that it will be necessary to electrify energy uses in sectors that now rely on direct energy use of fossil fuels. See, for example, J. Jenkins and S. Thernstrom, "Deep Decarbonization of the Electric Power Sector: Insights From Recent Literature," Energy Innovation Reform Project, February 2017 (hereafter "Jenkins & Thernstrom Literature Review"), <http://innovationreform.org/wp-content/uploads/2017/03/EIRP-Deep-Decarb-Lit-Review-Jenkins-Thernstrom-March-2017.pdf>. A recent addition to the deep decarbonization literature is the Natural Resources Defense Council (NRDC) report *America's Clean Energy Frontier: The Pathway to a Safer Climate Future*, September 2017, <https://www.nrdc.org/resources/americas-clean-energy-frontier-pathway-safer-climate-future>.

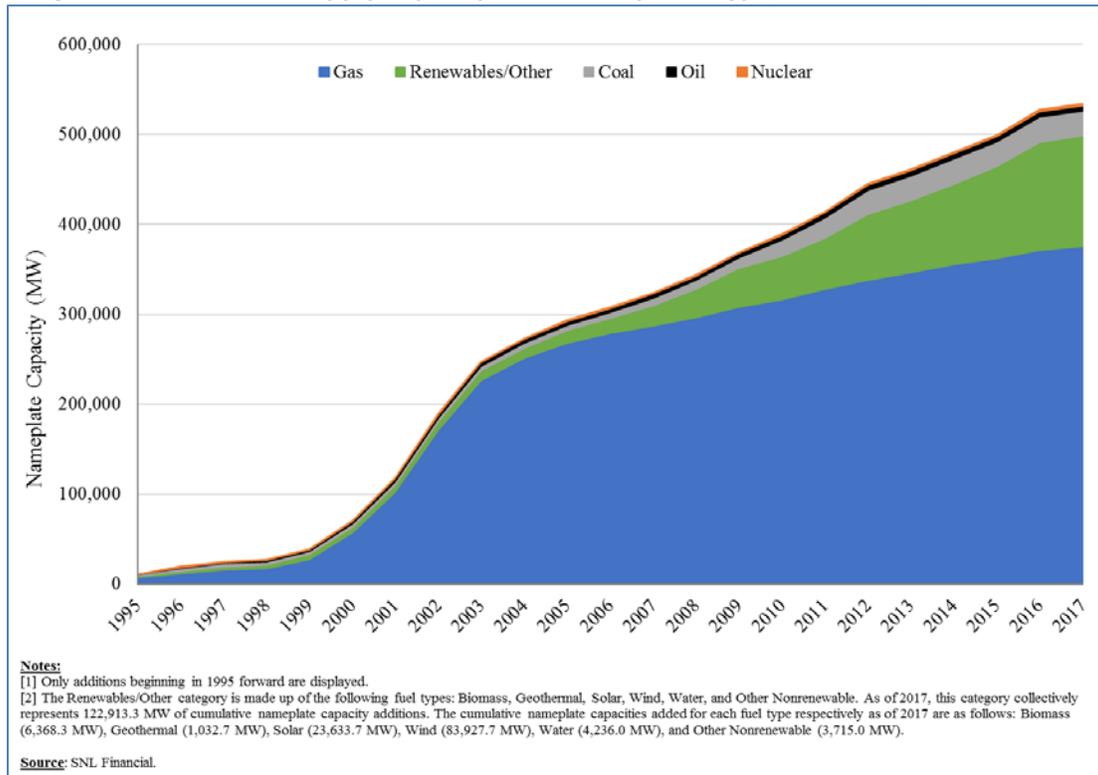
⁶³ NEPA, 42 U.S.C. §4321 et seq.

⁶⁴ U.S. Court of Appeals for the District of Columbia Circuit, *Sierra Club et al. v. FERC*.

⁶⁵ U.S. Department of Energy, "Staff Report to the Secretary on Electricity Markets and Reliability," August 2017; Quadrennial Energy Review Task Force, "Transforming the Nation's Electricity System," Second Installment Report of the Quadrennial Energy Review, January 6, 2017; P. Hibbard, S. Tierney, and K. Franklin, "Markets, Reliability and the Evolving U.S. Power System"; J. Chang et al., "Advancing Past 'Baseload' to a Flexible Grid: How Grid Planners and Power Markets Are Better Defining System Needs to Achieve a Cost-Effective and Reliable Supply Mix," prepared for NRDC by the Brattle Group, June 26, 2017; National Academy of Sciences, "Enhancing the Resilience of the Nation's Electricity System," July 20, 2017.

- retirements of older and less efficient fossil-fueled generating assets;
- increases in gas-fired generation in the past decade, in part as a result of its cost advantages relative to coal-fired power production and the ability of gas-fired plants to operate flexibly;
- relatively flat demand for electricity;
- increased deployment of distributed energy resources (e.g., solar, wind, microgrids, demand-response capability, fuel cells, small-scale storage, energy efficiency, and combined heat and power systems) on customers’ premises or otherwise located close to customer loads; and
- the introduction of “smart grid” software systems and physical devices allowing greater operational visibility and operational controls on the electric grid.

Figure 16: U.S. Power Supply Capacity Additions by Fuel Type; Cumulative, 1995-2017⁶⁶



FERC is very familiar with the changing character of the electric grid and the complex set of technological, economic, environmental, and policy factors driving such changes. Over the past few years, for example, FERC commissioners and/or staff have conducted several technical conferences that explore the implications of such changes and have solicited public comments on these issues.⁶⁷ FERC

⁶⁶ P. Hibbard, S. Tierney, and K. Franklin, “Electricity Markets, Reliability, and the Evolving U.S. Power System,” at 31 (SNL Financial data).

⁶⁷ See, for example, the following administrative records and documents:

- the June 22, 2017, Reliability Technical Conference Regarding the Bulk-Power System (Docket No. AD17-8-000);
- the May 1, 2017, Technical Conference on State Policies and Wholesale Markets Operated by ISO New England Inc., New York Independent System Operator, Inc., and PJM Interconnection, LLC (Docket No. AD17-11-000);
- the June 1, 2016, Reliability Technical Conference (Docket No. AD16-15-000);
- the February 19, 2015, Technical Conference on EPA’s Clean Power Plan (AD15-4);
- the September 25, 2013, Technical Conference on Centralized Capacity Markets in RTOs/ISOs (AD13-7-000); and

staff have also prepared numerous reports on related issues in recent years.⁶⁸

Many of these trends have contributed to increased demand for natural gas by the power sector, as explained above. But some of them – such as the increasing penetration of large-scale renewable projects, small-scale non-fossil distributed energy resources, operational controls on the system, and flat demand – together may have the effect of dampening, offsetting, and/or significantly altering the shape of the demand for natural gas in the years ahead.

Opposition to gas pipelines and related facilities: Opposition to gas pipelines and LNG facilities has been common in the industry for decades (and was in fact mentioned in the 1999 Policy Statement).⁶⁹ In recent years, however, the level and intensity of opposition to pipeline expansions and new pipelines has increased substantially. The diverse opponents to pipeline projects raise a variety of concerns, including not only those highlighted in the Policy Statement, like the taking of private property and impacts on land values, but many others, including environmental impacts, safety issues, and community impacts. These issues now show up relatively routinely in the comments of members of the public and intervenors in FERC dockets on pipeline and LNG facility applications. As described by former Chairman Norman Bay and Commissioner and former Chairman Cheryl LaFleur, protesters now show up at Commission meetings and personal residences.⁷⁰ The increased intensity of opposition to facilities is one of the reasons cited by former Chairman Bay for his belief that FERC should consider revising its certification policy.⁷¹

The new norm is for longer reviews with more extensive comments and questions from the public. More concerns are being raised in many of those comments about the need for better opportunities for meaningful public input in the context of dockets (which involve complicated technical information and formal administrative procedures), and there are increasing concerns about Commission policy more broadly. Advocacy in opposition to new infrastructure and new projects has increased, as has litigation about project approvals. There is stronger and more organized public outreach, and in many cases greater scrutiny by politicians whose constituents are affected by pipeline proposals.⁷²

– five regional conferences held in August 2012 on issues at the intersection of the gas and electric industries, described in the “Staff Report on Gas-Electric Coordination Technical Conferences” (Docket No. AD12-12-000), November 15, 2012.

⁶⁸ See, for example, periodic staff reports on the state of the markets, demand response, gas-electric coordination, reliability, and energy infrastructure, <https://www.ferc.gov/legal/staff-reports.asp>.

⁶⁹ See, for example: “Under section 7(h) of the NGA, a pipeline with a Commission-issued certificate has the right to exercise eminent domain to acquire the land necessary to construct and operate its proposed new pipeline when it cannot reach a voluntary agreement with the landowner. In recent years, this has resulted in landowners becoming increasingly active before the Commission. Landowners and communities often object both to the taking of land and to the reduction of their land’s value due to a pipeline’s right-of-way running through the property. As part of its environmental review of pipeline projects, the Commission’s environmental staff works to take these landowners’ concerns into account, and to mitigate adverse impacts where possible and feasible.” Policy Statement, at 15.

⁷⁰ Then-Chairman Cheryl LaFleur, National Press Club Speech, January 27, 2015, <https://www.ferc.gov/media/videos/lafleur/2015/012715-lafleur.pdf>.

⁷¹ In explaining this position, then-Chairman Bay cited the “increased controversy” surrounding pipeline infrastructure as well as the “considerable public interest” associated with concerns over the production of gas, methane emissions, and the use of fracking. FERC, National Fuel Gas Supply Corporation Empire Pipeline, Inc., Docket Nos. CP15-115-000 CP15-115-00, “Order Granting Abandonment and Issuing Certificates,” February 3, 2017, <https://www.ferc.gov/CalendarFiles/20170203194955-CP15-115-000.pdf>.

⁷² H. Northey, “Developers Face ‘New Reality’ of Protests, Longer Reviews,” Greenwire, June 3, 2016, <https://www.eenews.net/stories/1060038277>; C. Kunkel and T. Sanzillo, “Risks Associated with Natural Gas Pipeline Expansion in Appalachia,”

A constitutional and statutory challenge to FERC's pipeline permitting process has also been launched recently. The lawsuit maintains that FERC's certification process violates the U.S. Constitution and the Natural Gas Act by allowing privately owned pipeline developers to take private property through eminent domain.⁷³

More intense opposition to new pipeline projects has thus emerged in parallel with the increased demand for natural gas in different customer segments. Just as there are complex drivers affecting the market-demand side of the issue, there are complex factors affecting the character of the opposition. Many opponents raise concrete and specific concerns about the practical impacts of particular proposals and do not think that FERC properly balances such impacts against market demand for natural gas.

As one observer has noted, "Activists opposed to the oil and gas industry argue, for example, that building thousands of miles and billions of dollars' worth of new pipeline infrastructure effectively locks the nation into many more decades of fossil fuel development at a time, they say, when it should be transitioning to cleaner forms of energy. But for others ..., the concerns are more local. They complain that state and federal regulators are often too quick to approve new projects that come with real risks....With gas pipelines, some worry about the cumulative effects of methane leaks, which can significantly worsen air quality and compound global warming. Gas pipelines are also highly pressurized, generating concerns about explosions."⁷⁴

Pipeline opponents are also raising concerns that requests for more pipeline capacity reflect inappropriate and anticompetitive practices. They point to the use of affiliate contracts to support the need for proposed pipeline projects, with the risk of undue costs to ratepayers if arrangements with affiliates do not reflect true LDC need and yet allow pipelines to be built.⁷⁵

Changes in the science of climate change: In the nearly two decades since 1999, the scientific consensus about climate change has greatly increased, both in terms of human influences on climate conditions and in terms of the impacts of the changing climate. The 1995 report of the Intergovernmental Panel on Climate Change (IPCC) was the most recent one available at the time FERC

Institute for Energy Economics and Finance, April 2016, https://www.eenews.net/assets/2016/05/25/document_daily_03.pdf; P. Moskowitz, "With the Boom in Oil and Gas, Pipelines Proliferate in the U.S.," *Yale Environment 360*, October 6, 2014 (hereafter "Boom in Oil and Gas"), http://e360.yale.edu/features/with_the_boom_in_oil_and_gas_pipelines_proliferate_in_the_us; R. Nemec, "Pipeline Building Boom: Is It Coming to Your Area Anytime Soon?" *Pipeline & Gas Journal*, April 2017, <https://pgjonline.com/2017/04/03/pipeline-building-boom-is-it-coming-to-your-area-anytime-soon/>; then-Chairman Cheryl LaFleur, National Press Club Speech.

⁷³ U.S. District Court for the District of Columbia, *Bald Alliance et al. v. FERC et al.*, case 1:17-cv-01822, filed September 5, 2017, https://www.law360.com/dockets/download/59af249ee944eb2a3c000001?doc_url=https%3A%2F%2Fecf.dcd.uscourts.gov%2Fdoc1%2F04516206606&label=Case+Filing.

⁷⁴ P. Moskowitz, "Boom in Oil and Gas."

⁷⁵ Environmental Defense Fund (EDF), Petition for a Declaratory Ruling that Precedent Agreements and Transportation Agreements Are Subject to Review Under Public Service Law Section 110(4), New York Public Service Commission Case No. 17-G-0610, filed October 2, 2017, <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=17-g-0610&submit=Search>; Oil Change International, "Art of the Self-Deal: How Regulatory Failure Lets Gas Pipeline Companies Fabricate Need and Fleece Ratepayers," September 2017, http://priceofoil.org/content/uploads/2017/09/Gas_Pipeline_Ratepayer_Report.pdf; Sierra Club, Antitrust Issues Raised by the Nexus Gas Transmission Project, FERC Docket No. CP16-22-000, filed at Federal Trade Commission and Department of Justice, November 16, 2016, <https://www.sierraclub.org/sites/www.sierraclub.org/files/blog/P.%20Gallagher%20to%20OPC%20re%20NEXUS%2011-16-16.pdf>; Sierra Club, Antitrust Complaint Against Dominion Resources, Inc., filed at the Federal Trade Commission, June 23, 2016, <http://wp.vasierraclub.org/LetterInFull.pdf>.

issued its 1999 Policy Statement. (The IPCC issues assessments periodically, and not annually.) The 1995 IPCC assessment (the so-called Second Assessment) concluded: “The balance of evidence suggests a discernible human influence on global climate.”⁷⁶ Since then, the IPCC’s findings have become progressively strong, and the scientific community now has 95 percent confidence (i.e., the IPCC scientists believe it is “extremely likely”) that “human influence has been the dominant cause of the observed warming since the mid-20th century.”⁷⁷ Among the IPCC’s findings since 1995:

- In 2001 (from the IPCC’s Third Assessment): “There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.”⁷⁸
- In 2007 (from the IPCC’s Fourth Assessment): “Warming of the climate system is unequivocal... Most of the observed increase since the mid-20th century is very likely [i.e., greater than 90 percent probability] due to the observed increase in anthropogenic [human-caused] greenhouse gas concentrations.”^{79,80} Also: “It is likely that there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica)... Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.”⁸¹
- In 2013 (from the IPCC’s Fifth Assessment, the most recent one published): “It is extremely likely [95 percent confidence] that human influence has been the dominant cause of the observed warming since the mid-20th century.”^{82,83} Also: “Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes... This evidence for human influence has grown since [the fourth assessment]... It is extremely likely more than half of the observed increase in global average surface temperature from 1951 to

⁷⁶ “The balance of evidence, from changes in global mean surface air temperature and from changes in geographical, seasonal and vertical patterns of atmospheric temperature, suggests a discernible human influence on global climate.” IPCC, *Climate Change 1995: Second Assessment Report of the IPCC*, 1995, at 5, <https://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf>. Further, the 1995 assessment stated on page 22: “Since the 1990 IPCC Report, considerable progress has been made in attempts to distinguish between natural and anthropogenic influences on climate.”

⁷⁷ IPCC, “Summary for Policy Makers,” *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the IPCC*, https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf.

⁷⁸ IPCC, “Climate Change 2001: The Scientific Basis,” Contribution of Working Group I to the *Third Assessment Report of the IPCC*, 2001, at 10 (“Summary for Policy Makers”), https://www.ipcc.ch/ipccreports/tar/wg1/pdf/WG1_TAR-FRONT.PDF.

⁷⁹ “The IPCC describes how it uses language to describe the level of certainty or uncertainty that exists surrounding a particular finding. With regard to “very likely” language, the IPCC has explained: “Where uncertainty in specific outcomes is assessed using expert judgment and statistical analysis of a body of evidence (e.g., observations or model results), then the following likelihood ranges are used to express the assessed probability of occurrence: virtually certain >99%; extremely likely >95%; very likely >90%; likely >66%; more likely than not > 50%; about as likely as not 33% to 66%; unlikely <1%.” IPCC, “Climate Change 2007: Synthesis Report,” Contribution of Working Groups I, II and III to the Fourth Assessment Report of the IPCC, 2007 (hereafter “IPCC 2007”), at 27, https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_full_report.pdf.

⁸⁰ IPCC 2007, at 2.

⁸¹ IPCC 2007, at 2, 72.

⁸² In the 2013 report’s “Summary for Policy Makers” (at 2, footnote 4): “The following terms have been used to indicate the assessed likelihood of an outcome or a result: virtually certain 99–100% probability, very likely 90–100%, likely 66–100%, about as likely as not 33–66%, unlikely 0–33%, very unlikely 0–10%, exceptionally unlikely 0–1%. Additional terms (extremely likely: 95–100%, more likely than not >50–100%, and extremely unlikely 0–5%) may also be used when appropriate.” IPCC, “Climate Change 2013: The Physical Science Basis,” 2013.

⁸³ IPCC, “Summary for Policy Makers,” 2013.

2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together.”⁸⁴

Changes in climate impacts: In parallel, the state of knowledge about the impacts of climate change has advanced substantially since 1999. For example, the most recent congressionally mandated National Climate Assessment was published by the U.S. government in 2014. As the assessment stated, “A team of more than 300 experts guided by a 60-member Federal Advisory Committee produced the report, which was extensively reviewed by the public and experts, including federal agencies and a panel of the National Academy of Sciences.”⁸⁵ The assessment reached the following conclusions:

Over recent decades, climate science has advanced significantly. Increased scrutiny has led to increased certainty that we are now seeing impacts associated with human-induced climate change. With each passing year, the accumulating evidence further expands our understanding and extends the record of observed trends in temperature, precipitation, sea level, ice mass, and many other variables recorded by a variety of measuring systems and analyzed by independent research groups from around the world. It is notable that as these data records have grown longer and climate models have become more comprehensive, earlier predictions have largely been confirmed. The only real surprises have been that some changes, such as sea level rise and Arctic sea ice decline, have outpaced earlier projections.

What is new over the last decade is that we know with increasing certainty that climate change is happening now. While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50 years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional contributions from forest clearing and some agricultural practices.⁸⁶

The 841-page National Climate Assessment includes extensive and detailed information on the impacts of climate change on various sectors of the economy (e.g., agriculture, forestry, energy production and use, human health) and regions of the country. (Excerpts from the high-level overview are included in the text box “Climate Change and the American People,” below.) As noted in the 2014 assessment, “Americans are noticing changes all around them.” The summer and fall of 2017 displayed examples of extreme weather events and climate change impacts: massive forest fires in the Pacific Northwest⁸⁷ and in Northern California,⁸⁸ an all-time high temperature in San Francisco,⁸⁹ flooding in Houston after Hurricane Harvey dumped record-breaking amounts of rain,⁹⁰ and devastation to Puerto

⁸⁴ IPCC, “Summary for Policy Makers,” 2013.

⁸⁵ <http://nca2014.globalchange.gov/report>.

⁸⁶ J. Melillo, et al., eds., *Climate Change Impacts in the United States: The Third National Climate Assessment, 2014*, U.S. Global Change Research Program, 2014, doi:10.7930/J0Z31WJ2, <http://nca2014.globalchange.gov/highlights/overview/overview>.

⁸⁷ <https://www.nasa.gov/image-feature/goddard/2017/smoke-and-fires-light-up-pacific-northwest>.

⁸⁸ <http://www.cnn.com/2017/10/10/us/california-fires-napa/index.html>.

⁸⁹ <https://weather.com/forecast/regional/news/west-heat-wave-all-time-record-heat-early-september-2017>.

⁹⁰ https://www.washingtonpost.com/news/capital-weather-gang/wp/2017/08/29/harvey-marks-the-most-extreme-rain-event-in-u-s-history/?utm_term=.d4380049131b.

Rico and the U.S. Virgin Islands caused by Hurricane Maria.⁹¹ In 2016, the earth's temperature was the highest on record—with 2015 holding the previous record, and 2014 holding the record before that.

Climate Change and the American People

Climate change, once considered an issue for a distant future, has moved firmly into the present. Corn producers in Iowa, oyster growers in Washington State, and maple syrup producers in Vermont are all observing climate-related changes that are outside of recent experience. So, too, are coastal planners in Florida, water managers in the arid Southwest, city dwellers from Phoenix to New York, and Native Peoples on tribal lands from Louisiana to Alaska. This National Climate Assessment concludes that the evidence of human-induced climate change continues to strengthen and that impacts are increasing across the country.

Americans are noticing changes all around them. Summers are longer and hotter, and extended periods of unusual heat last longer than any living American has ever experienced. Winters are generally shorter and warmer. Rain comes in heavier downpours. People are seeing changes in the length and severity of seasonal allergies, the plant varieties that thrive in their gardens, and the kinds of birds they see in any particular month in their neighborhoods.

Other changes are even more dramatic. Residents of some coastal cities see their streets flood more regularly during storms and high tides. Inland cities near large rivers also experience more flooding, especially in the Midwest and Northeast. Insurance rates are rising in some vulnerable locations, and insurance is no longer available in others. Hotter and drier weather and earlier snow melt mean that wildfires in the West start earlier in the spring, last later into the fall, and burn more acreage. In Arctic Alaska, the summer sea ice that once protected the coasts has receded, and autumn storms now cause more erosion, threatening many communities with relocation.

Scientists who study climate change confirm that these observations are consistent with significant changes in Earth's climatic trends. Long-term, independent records from weather stations, satellites, ocean buoys, tide gauges, and many other data sources all confirm that our nation, like the rest of the world, is warming. Precipitation patterns are changing, sea level is rising, the oceans are becoming more acidic, and the frequency and intensity of some extreme weather events are increasing. Many lines of independent evidence demonstrate that the rapid warming of the past half-century is due primarily to human activities.

The observed warming and other climatic changes are triggering wide-ranging impacts in every region of our country and throughout our economy. Some of these changes can be beneficial over the short run, such as a longer growing season in some regions and a longer shipping season on the Great Lakes. But many more are detrimental, largely because our society and its infrastructure were designed for the climate that we have had, not the rapidly changing climate we now have and can expect in the future. In addition, climate change does not occur in isolation. Rather, it is superimposed on other stresses, which combine to create new challenges.

National Climate Assessment, 2014, Introduction (pages 1-2),

http://s3.amazonaws.com/nca2014/high/NCA3_Climate_Change_Impacts_in_the_United%20States_HighRes.pdf?download=1

The Fourth National Climate Assessment is underway, and a draft of the report was made public in June 2017. The draft states that “new observations and new research have increased our understanding of past, current, and future climate change since the Third U.S. National Climate Assessment (NCA3)... Since NCA3 [in 2014], stronger evidence has emerged for continuing, rapid, human-caused warming of the global atmosphere and ocean. This report concludes that ‘it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century. For the warming over the last century, there is no convincing alternative explanation supported by the extent of the observational evidence.’ The last few years have also seen record-breaking, climate-related weather extremes, the three warmest years on record for the globe, and continued decline in

⁹¹ https://www.washingtonpost.com/news/post-nation/wp/2017/09/20/hurricane-maria-takes-aim-at-puerto-rico-with-force-not-seen-in-modern-history/?utm_term=.4c9377caa535.

arctic sea ice. These trends are expected to continue in the future over climate (multidecadal) timescales. Significant advances have also been made in our understanding of extreme weather events and how they relate to increasing global temperatures and associated climate changes. Since 1980, the cost of extreme events for the United States has exceeded \$1.1 trillion.”⁹²

Changes in the long-term outlook for a much lower-carbon energy system: Since FERC issued its 1999 Policy Statement, there has been a growing body of analyses assessing the types of long-term changes in energy production and use that will be consistent with limiting the effects of climate change on average global temperatures to no more than 2°C. Such analyses, often referred to as the “deep decarbonization” literature, explore the implications of reducing anthropogenic greenhouse gas emissions globally by approximately 80 percent below current levels of emissions by 2050. Unlike the EIA’s long-term energy outlook, whose projections (by design) are based on an assumption of no new changes in public policy, and whose results were described previously, these assessments explicitly attempt to model the types of changes in patterns of energy usage that would be required to reduce emissions to these levels. The targeted emissions reductions reflected in these studies are aligned with the national commitments in the 2015 Paris Accord and are consistent with the assessment conducted as part of the 2016 U.S. Mid-Century Strategy report.⁹³

A 2017 literature review of 30 deep decarbonization studies published since 2014 points to several themes from the body of work.⁹⁴ The dominant conclusion is that the “electric power sector is widely expected to be the linchpin of efforts to reduce greenhouse gas (GHG) emissions...To reach these [emission-reduction] goals, the power sector would need to cut emissions nearly to zero, while expanding to electrify (and consequently decarbonize) portions of the transportation, heating, and industrial sectors.” The themes that emerge include the following observations (with quoted excerpts from the 2017 literature review):

[T]here is strong agreement in the literature that a diversified mix of low-CO₂ generation resources offers the best chance of affordably achieving deep decarbonization.⁹⁵

A low-carbon power sector must expand to electrify and decarbonize greater shares of transportation, heating, and industrial energy demand as part of a strategy for economy-wide emissions reductions.⁹⁶

By contrast, reaching near-zero emissions will require virtually all unabated coal- and gas-fired power plants to be replaced by zero-emissions sources.⁹⁷

⁹² U.S. Global Change Research Program, Climate Science Special Report (CSSR), Final Clearance 28 June 2017 Fifth-Order Draft (5OD), at 11, <https://assets.documentcloud.org/documents/3920195/Final-Draft-of-the-Climate-Science-Special-Report.pdf>.

⁹³ White House, “United States Mid-Century Strategy for Deep Decarbonization,” November 2016, https://unfccc.int/files/focus/long-term_strategies/application/pdf/mid_century_strategy_report-final_red.pdf.

⁹⁴ Jenkins & Thernstrom literature review. “These studies employ a variety of methods, including detailed power system optimization models, higher-level energy-economic and integrated assessment models, and scenario-driven exercises. They also span different scopes, from the regional to national to global, and they entail different research objectives.” Jenkins & Thernstrom literature review, at 1. See also NRDC, *America’s Clean Energy Frontier*.

⁹⁵ Jenkins & Thernstrom literature review, at 1.

⁹⁶ Jenkins & Thernstrom literature review, at 2.

⁹⁷ Jenkins & Thernstrom literature review, at 3.

Deep decarbonization may require a significantly different mix of resources than more modest goals; long-term planning is important to avoid lock-in of suboptimal resources. It is important to emphasize that the lowest-cost portfolio of resources suited to achieving moderate emissions reductions may differ dramatically from the portfolio needed to efficiently reach deep decarbonization goals. These conclusions suggest that if power generation resources are built out without considering long-term decarbonization objectives, costly “lock-in” of a suboptimal resource portfolio is possible. Installed capacities of wind, solar, uncontrolled natural gas, and low-capture-rate CCS [carbon capture and sequestration] plants that are suitable for achieving mid-term objectives could all exceed their optimal share for substantially decarbonized power systems.⁹⁸

This literature review highlights the results of a diverse body of analyses that point to the need for continued changes in the nation’s energy system in the decades ahead in order to help avoid the worst efforts of climate change. It is always risky to forecast too far into the future regarding how energy systems may change. However, the climate change and decarbonization literature suggests that the role of natural gas over the next decades may fall somewhere between that of a short-term and a long-term transitional resource, depending on the economics of low-carbon technologies and the pace of public concern and political change.

One implication is that in the absence of significant technological advances that allow for the retrofitting of existing gas-fired power plants with CCS equipment and systems, and/or the deployment of new gas-fired generation facilities designed to incorporate CCS systems, natural gas may evolve to play a much more limited role in future energy systems than might be imagined today. The analyses indicate further that much less gas may be used directly for heating and cooling systems in buildings. And in light of the long-lived nature of energy infrastructure (such as gas pipelines), prudence would dictate taking a hard look at the implications of such long-term projects in pipeline certification cases (to look at the potential for stranded assets, for example, if new gas transportation systems are approved and constructed and go into operation).

This discussion of deep-decarbonization analyses is not meant to provide a dispositive viewpoint on the future track of energy infrastructure development. FERC’s pipeline certification process, however, results in long-term infrastructure development and the incurrence of significant up-front capital investments. In this context it is important to consider the combination of climate, economic, and policy influences that are already driving a significant transformation in energy production and use and that may further accelerate this transformation going forward.

The literature points to an increasing degree of uncertainty surrounding the long-term outlook for natural gas demand – and for the useful life of new delivery infrastructure investments that it depends on. The uncertainty raises important questions, at least, for the level of new pipeline capacity that is needed to meet national energy market needs (and that may become stranded under some future scenarios). A recent report by analysts at Goldman Sachs, for example, points to gas transportation capacity outpacing demand in Appalachia, with new pipelines there being only partially

⁹⁸ Jenkins & Thernstrom literature review, at 3.

filled.⁹⁹ Such recent outlooks, in conjunction with the decarbonization studies, provide insights that tend to offset the view typically shared by developers of gas transportation infrastructure (described above), who foresee a long-term and sustained growth in demand for natural gas in the U.S.

IV. Recommendations for Federal Pipeline Certification Policy, Given the Implications of a Rapidly Changing Industry

The many changes that have occurred in the nearly two decades since FERC's 1999 Policy Statement warrant a fresh look at whether the guidance adopted at that time and applied in certification dockets since then still remains appropriate and, if not, what changes are now appropriate in order for FERC to fulfill the facility-review functions mandated under the Natural Gas Act. In light of the many substantial changes in the nature of natural gas supply and demand that have occurred since 1999, are occurring today, and will likely occur over the next decade, the time is ripe for FERC to undertake a structured and collaborative review of its pipeline certification guidance and policy.

The motivation for FERC to review its pipeline certification guidance and policy is similar to what it was in 1999. At that time, FERC was considering evidence and insights about changes then underway in the gas industry that, in the Commission's view, warranted evolution of FERC's policies on certification and the pricing of new construction projects. FERC's goals in 1999 were to "foster competitive markets, protect captive customers, and avoid unnecessary environmental and community impacts while serving increasing demands for natural gas. It should also provide appropriate incentives for the optimal level of construction and efficient customer choices."¹⁰⁰

Those goals may still be relevant today, but their meaning is likely to be different, and additional guidance seems appropriate to us in light of the complex set of changes that have taken place in the larger energy industry and in natural gas markets in particular. Various aspects of FERC's 1999 Policy Statement guidance deserve new attention, with the overall goal of deciding what factors should be considered in determining whether new pipeline construction is needed.

In 1999, FERC sought to clarify its policy so that the Commission could better determine whether to issue a CPCN for interstate pipeline facilities.¹⁰¹ FERC concluded that in the context of changes leading up to 1999, such clarification was needed. The conditions at the time included:

- The relatively recent deregulation of upstream natural gas production and sales;

⁹⁹ "Appalachia gas pipeline capacity will outpace demand in the coming years, according to Goldman Sachs Group Inc., even as the U.S. energy market and overseas buyers consume more gas produced in the Northeast. In the short term, electric power plants will balance the market as they continue switching from coal to natural gas. But in Goldman's analysis, researchers predict that rising gas demand simply as a function of fuel-switching tails off in time, as efficient combined-cycle power plants, wind power, solar panels and a declining number of coal retirements cut into the rise in gas demand.... Analysts there expect new Appalachia region pipeline additions to accelerate through 2018 and ahead of large increases in demand slated for 2019.... "Beyond rising gas burn, we believe that balancing the U.S. gas market in 2018–20 will require that new Appalachia pipelines remain only partially filled as they come online," Goldman analysts wrote." D. Iaconangelo, "Appalachian Pipeline Capacity To Outpace Demand – Report," *E&E News*, September 26, 2017, <https://www.eenews.net/energywire/2017/09/26/stories/1060061647>.

¹⁰⁰ Policy Statement, at 13.

¹⁰¹ Policy Statement, at 13-14.

- The restructuring of the natural gas industry so as to encourage competition by unbundling and separating gas delivery transportation from commodity supply;
- The potential for competition among suppliers, potential deliverers, and potential users for use of capacity on the interstate system;
- The desire to create incentives for investment in and additions of new natural gas delivery capacity on the interstate pipeline system; and
- Anticipated continued growth in demand for natural gas.

Nearly two decades later, interstate natural gas markets and their relationships to larger energy systems reflect quite different conditions. There have been many changes since 1999, including:

- Significant additions to capacity on the interstate gas pipeline system;
- Substantial growth in domestic gas production in various basins around the U.S., with especially strong growth in the Marcellus/Utica region in the past decade;
- Relatively low commodity prices for natural gas in recent years;
- Large increases in U.S. consumption of natural gas;
- Major power-sector transitions that have increased power plants' use of gas, with those changes reflecting the enormous quantity of new gas-fired generating capacity added to the power system since 2000, the cost-competitiveness of gas-fired generation compared with output at less efficient coal plants, and the flexible operational attributes of gas-fired capacity;
- Heightened concerns among landowners, local groups, and others regarding the taking of property and adverse impacts associated with siting individual pipeline projects;
- Increased concerns regarding the potential to over build capacity on the interstate pipeline system in light of further transitions in the nation's energy system;¹⁰²
- The availability of technologies and practices in both the gas and electric systems that may allow more-efficient utilization of existing infrastructure and could mitigate the need to add new gas transportation capacity; and
- Growing questions regarding FERC's application of its balancing test regarding public benefit versus adverse consequences in the context of reviewing specific applications.

Given the complexities of these issues and the interrelationships among many of the post-1999 trends, the current content and implementation of FERC's certification policy should be reassessed. These trends support a shift in the standards or information requirements that FERC should use to balance public benefit with adverse consequences, including reconsideration of how information is

¹⁰² For example, a 2015 DOE study ("Natural Gas Infrastructure Implications of Increased Demand from the Electric Power Sector," February 2015) made the following findings:

- "Diverse sources of natural gas supply and demand will reduce the need for additional interstate natural gas pipeline infrastructure." (at vi)
- "Higher utilization of existing interstate natural gas pipeline infrastructure will reduce the need for new pipelines." (at vi)
- "Incremental interstate natural gas pipeline infrastructure needs in a future with an illustrative national carbon policy are projected to be modest relative to the Reference Case" (which did not include a national carbon policy) (at vi)
- "While there are constraints to siting new interstate natural gas pipeline infrastructure, the projected pipeline capacity additions in this study are lower than past additions that have accommodated such constraints (at vii)

weighted in the balance. These very complexities stand as a strong reason for FERC to take a fresh look at its policy.

For example, the Policy Statement currently provides (on page 27) that the “more interests adversely affected or the more adverse impact a project would have on a particular interest, the greater the showing of public benefits from the project required to balance the adverse impact.” The actual dockets on specific cases (and litigation related to them), however, are not likely to be the ideal place for parties to deliberate over the scope of benefits and adverse consequences (and trade-offs) that should be considered routinely by FERC in its reviews. This is the type of conclusion that FERC reached in deciding two decades ago to open inquiries into its certification policies for new natural gas facilities.¹⁰³ A broad review of policy will allow diverse parties to comment on these issues generically, rather than taking them in up the context of individual pipeline dockets (which are technical and procedurally challenging for meaningful input by non-technical people).

The many changes underway in the natural gas and electric industries warrant a close evaluation of how need is demonstrated in pipeline certification cases. Specifically, it seems timely to revisit the many issues raised during the last review two decades ago, in consideration of the fundamental shifts that have taken place in market dynamics, supply and demand factors, and industry relationships.

With respect to affiliate commitment questions, FERC, in consultation with stakeholders, may wish to quantitatively and qualitatively reassess the role of affiliate contracts and precedent agreements in pipeline certification proposals, given the evolution of industry relationships over the past 20 years. In this context, it would be appropriate to evaluate quantitatively how the role of affiliate commitments has evolved in pipeline proposals over time. FERC may also wish to seek relevant background information on the nature of LDC customer-need determinations in state regulatory processes to understand contextually the drivers of demand from affiliated companies. With respect to electric sector affiliations, FERC could assess the regulatory policies and market factors driving electricity fuel supply decisions and transportation procurements and commitments. To the extent that there exists a qualitatively different set of circumstances and drivers around affiliate relationships and transactions, FERC may conclude that it is appropriate to adjust its guidance in that respect.

The combination of power sector demand as the dominant driver of natural gas demand growth, on the one hand, and the potentially fundamental transition underway in the electric industry, on the other, raises new and challenging questions, the answers to which could improve the quality and

¹⁰³ The Commission issued the Notice of Proposed Rulemaking (NOPR) in Docket No. RM98-10-000 (Regulation of Short-term Natural Gas Transportation Services) in 1998, and the Notice of Inquiry (NOI) in Docket No. RM98-12-000 (Regulation of Interstate Natural Gas Transportation Services) on July 29, 1998. In addition, the Commission held a public conference on June 7, 1999. The Policy Statement explains at 2: “Information received in these proceedings as well as recent experience evaluating proposals for new pipeline construction persuade us that it is time for the Commission to revisit its policy for certifying new construction not covered by the optional or blanket certificate authorizations. In particular the Commission’s policy for determining whether there is a need for a specific project and whether, on balance, the project will serve the public interest. Many urge that there is a need for the Commission to authorize new pipeline capacity to meet the growing demand for natural gas. At the same time, others already worried about the potential for capacity turnback, have urged the Commission to be cautious because of concerns about the potential for creating a surplus of capacity that could adversely affect existing pipelines and their captive customers. Accordingly, the Commission is issuing this policy statement to provide the industry with guidance as to how the Commission will evaluate proposals for certifying new construction.”

efficiency of FERC's certification review process and associated pipeline project development. Questions relate to the implications of incentives in wholesale electricity market structures for fuel-supply choice and for demand for gas in various regions of the country; the potential for changing electric industry circumstances to fundamentally shift – one way or the other – the need for incremental gas-delivery infrastructure; the impact of state resource planning and procurement requirements, as well as fuel supply cost-recovery policies, in altering the seasonal requirements for gas-fired generating resources; the ability of new technologies and operational practices to use existing gas-delivery infrastructure more efficiently; and the implications of state carbon-reduction policies and integrated assessments of regional electricity supply and demand for the need to consider non-gas alternatives for meeting future demand growth (including in the context of NEPA reviews). While most of these issues are not necessarily new, they are undoubtedly changing in meaningful ways and at an accelerated pace, in a manner that could have important implications for the information collected and assessed in FERC certification reviews on a going-forward basis.

Opening a new docket to solicit comment on various points would be an appropriate vehicle by which FERC could obtain broad public input and fresh consideration of the substantial recent and ongoing changes in energy industries and what changes in FERC's certification policy may be appropriate in light of these transitions. The questions that could be posed for comment might raise some of the same types of issues examined by FERC two decades ago, as well as other ones raised by the trends of the past two decades. Examples of such questions include:

- Should FERC develop more prescriptive standards for reviewing applications for new pipelines, in light of the increasingly uncertain forecasts of the need for incremental pipeline capacity?
- Do changes underway in both the gas and electric industries – and the increasingly strong interrelationship between them – warrant a more integrated assessment of sectoral demand and electricity market forces in assessing natural gas pipeline need in Section 7 proceedings?
- Should FERC require regional planning regarding gas transportation resources similar to the regional planning requirement imposed on electric transmission owners?
- Should FERC apply a higher threshold standard and greater scrutiny with respect to demonstration of need, market demand, and public benefit where an affiliate (e.g., gas LDC, electric utility, and/or independent power producer) is involved in the proposed project?
- Should determination of need for a proposed pipeline project be the threshold determination (instead of the current threshold determination, which is whether the project could proceed without subsidies from existing customers)?
- Should FERC's balancing of benefits against adverse impacts be expanded to include noneconomic factors (e.g., should environmental impacts be among the adverse impacts FERC considers while applying the balancing test)?
- Should FERC give deference to state regulatory approvals (e.g., of contracts between pipeline companies and affiliated shippers, including either local distribution companies or power plants)

only when such approvals involve a regulatory review of whether such contracts represent the least-cost method of serving such demand, taking into account other strategies (e.g., energy efficiency in the case of an LDC contract, or dual-fuel capability at the power plant, or application of technologies to increase throughput on existing pipeline capacity)?

- Should FERC require a demonstration of need and public benefit based on a showing that non-pipeline alternatives have been considered as options to meet the demand of shippers (e.g., an integrated gas/electric resource plan or an integrated gas/electric reliability study, energy efficiency programs in the case of an LDC contract, dual-fuel capability at a power plant, or adoption and application of technologies to increase throughput on existing pipeline capacity)?
- Should FERC impose a greater burden to show that a pipeline is needed when it is proposed to gain market share rather than to meet new market demand?
- How should FERC's policy take into account the views of a variety of interested constituencies (including competitors, customers, landowners, local communities, and others affected directly and indirectly by the pipeline and by the impacts of gas combustion), many of whom may have limited access to resources to participate as full parties in specific pipeline-review cases?
- How should FERC weigh the relative distribution of benefits and burdens across those interested and affected constituencies?
- How should FERC take into account the potential for stranded costs of new pipeline capacity that is later determined to be no longer needed in light of changes in the nation's current and future energy mix?
- Should FERC consider new ways for pipeline applicants to internalize the long-term monetary and non-monetary risks associated with near-term capacity investment decisions?

Given the important roles that natural gas resources now play in the U.S. economy, the many changes underway in the energy systems that will likely affect future natural gas production, delivery, and use in the future, and the importance of FERC administering its responsibilities under the Natural Gas Policy Act in a judicious manner, the time is right for a fresh look at the 1999 Policy Statement. Such an inquiry would support the goal the Commission stated in 1999: "In considering the impact of new construction projects on existing pipelines, the Commission's goal is to appropriately consider the enhancement of competitive transportation alternatives, the possibility of overbuilding, the avoidance of unnecessary disruption of the environment, and the unneeded exercise of eminent domain."