



Research

Energy Infrastructure Plans Should Reform Federal Approval Process

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Summary

- NEPA is the process by which the federal government coordinates approval for environmentally significant infrastructure projects. Long timelines for compliance are a potential barrier to near-term benefits from infrastructure spending. There are currently 73 energy projects undergoing review.
- Only a very small portion of infrastructure projects under NEPA require lengthy reviews, but those projects tend to be the highest value with the most potential benefits. A 2016 DOE report found that this review process can take an average of 70 months, but AAF's analysis of ongoing reviews shows an average closer to 90 months.
- Delaying these projects carries significant costs. Most of the energy projects undergoing NEPA review are high value, and would allow for cleaner energy infrastructure. This includes 11 liquefied natural gas (LNG) export terminals with an average potential revenue of \$223 million per month, 11 power plants (10 of which are low-emission sources) with an average potential revenue of \$4.3 million per month, and 15 electric transmission projects.

Introduction

The Trump Administration, and some in Congress, have called for a trillion dollars in infrastructure investments in the hope of boosting the United States' meager [1.9 percent growth rate](#). The federal requirement for approving environmentally significant infrastructure, the [National Environmental Policy Act](#) (NEPA), is a potential roadblock for new projects — even those likely to deliver some environmental benefit. Reforming NEPA should be an infrastructure policy priority. Only a small percentage of U.S. infrastructure projects are the ones that require years of review under NEPA, but the high value projects that could deliver the most benefit to the economy and environment tend to be the most likely to face those obstacles.

What is NEPA and Why Is It So Important?

NEPA was signed into law in 1969, and shortly after, President Nixon ordered a reorganization of federal environmental agencies, leading to the establishment of the Environmental Protection Agency (EPA). At the time, there was a recognition that many environmental issues were interstate in nature (air quality, interstate

waterways, etc.), therefore a structure was needed to address how the federal government managed its own regulations in concert with state and local regulations. NEPA was an attempt to create a one-stop shop that would streamline the regulatory compliance process for all levels of government, allowing a federal agency, the [Council on Environmental Quality \(CEQ\)](#), to coordinate environmental reviews of major infrastructure projects.

The NEPA process itself is simple. A proposed infrastructure project goes through the NEPA review process where it either is determined not to require an environmental review and receives a categorical exclusion (CE), or receives an environmental assessment (EA) that then determines if an environmental impact statement (EIS) is required. These decisions are carried out by federal agencies, which coordinate under the authority of the appropriate lead agency (e.g., a natural gas export terminal is under the authority of the Federal Energy Regulatory Commission, a highway under the Federal Transit Administration, etc.).

The scope of NEPA has not changed much since 1969, but the underlying regulations for which NEPA must assert compliance have grown substantially. As an example, the Endangered Species Act of 1973 resulted in a list of [135 endangered or threatened species](#). In 2009, the National Wildlife Foundation reported that there [1,361 endangered or threatened species](#). As of this writing, that list has grown to [1,627 endangered or threatened species](#) in the United States. Other restrictions, such as the Obama Administration's requirement for NEPA to [evaluate greenhouse gas emissions](#) from reviewed projects, and the [679 energy and environment regulations](#) that have been added to the federal register since 2005, have added to the red tape in NEPA's review process. While these regulations are well intentioned to improve environmental benefits, the process was not initially intended to have such a wide jurisdiction. This begs the question of if longer timelines are coinciding with better environmental quality, or if the same outcomes are achievable on a shorter timeframe.

If economic growth is an objective for infrastructure investment, then the length of the review process under NEPA is of concern. Even if the United States invested a trillion dollars in infrastructure today, it is highly unlikely we would see a comparable economic benefit in the near term, as most of the largest and projects require five years or more to review. At best, these projects are unlikely to offer any benefits until the project begins construction. As part of the Obama Administration's stimulus package, there was a plan to build a [carbon capture power plant](#) in California; that project is still awaiting approval under NEPA (though NEPA is not the only reason for that project's delays). That power plant has effectively contributed nothing to the economic recovery it was supposed to support. A previous American Action Forum (AAF) report estimated that [at least \\$157 billion](#) worth of energy projects are awaiting a decision under NEPA.

Costs of NEPA Compliance

Complying with NEPA can be a long and costly process. A 2016 [Department of Energy \(DOE\) report](#) estimated that it takes an average 21 months and costs \$386,000 to complete an EA, and 49 months and \$4.19 million to complete an EIS (overall 70 months and \$4.5 million). However, the timelines to receive an EA and EIS may be lengthening. Using data from the [DOE's NEPA status chart](#), AAF estimates that for the 73 ongoing projects it will take 22.5 months to complete an EA, and 67.7 months to complete an EIS—an average of 90 months for both.^[1]

Not every infrastructure project requires such an arduous timeline. A Government Accountability Office (GAO) report estimates that [95 percent of projects under NEPA review receive a CE](#), less than 5 percent require an EA, and less than 1 percent require an EIS. However, the biggest projects are often those that can provide the most

benefit, but also that tend to have a large enough environmental footprint to require an EIS.

Of the 73 projects covered by the DOE's NEPA status chart, 37 are projects of interest to conventional energy infrastructure. 15 are electricity transmission projects, 11 are LNG export terminals, eight are wind farms, one is a solar farm, one is a combined solar and natural gas power plant, and one is a carbon capture coal plant. All these projects will provide an environmental benefit. Natural gas will displace overseas coal consumption, transmission projects will allow more intermittent renewable sources to be reliably used for electricity production, and increased wind and solar production will displace domestic coal consumption. Of these projects, 22 were already determined to require an EIS, including all LNG export terminals. The remaining 15 projects may require an EIS, but are still in the EA phase of NEPA.

NEPA is disproportionately burdensome to the projects that could have the most benefit. While less than 1 percent of projects may require an EIS, it is the most impactful and important infrastructure projects—those high-value projects expected to produce both environmental and economic benefits—that are the most likely to be affected.

Potential Revenue of Energy Projects Needing NEPA Review

If an infrastructure project provides benefits, then, ostensibly, there is an incurred cost if the project is delayed because it delays the receiving of benefits, and potentially reduces the lifetime accrued benefits. Traditionally a cost of delay can be considered as the benefits minus the costs, multiplied by the time of delay. As there is little uniformity to calculating the benefits and costs of a diverse array of projects in NEPA review, a traditional cost of delay analysis cannot be applied to projects in the NEPA process. However, it is possible to look at the potential revenue that is forgone from delaying projects that should have some predictable income.

Natural Gas Exports

There are currently 11 natural gas liquefaction facilities that the DOE is tracking in its NEPA status sheet, 10 of which are included in the Federal Energy Regulatory Commission's (FERC) list of proposed LNG export terminals.

Proposed LNG Export Terminals			
Location	Company name	Capacity (Bcfd)	Potential Revenue (millions per month)
Pascagoula, MS	Gulf LNG Liquefaction	1.5	\$ 236
Cameron Parish, LA	Venture Global Calcasieu Pass	1.4	\$ 222
Brownsville, TX	Texas LNG Brownsville	0.6	\$ 87
Brownsville, TX	Rio Grande LNG – NextDecade	3.6	\$ 566
Brownsville, TX	Annova LNG Brownsville	0.9	\$ 142
Port Arthur, TX	Port Arthur LNG	1.9	\$ 293
Jacksonville, FL	Eagle LNG Partners	0.1	\$ 21

Plaquemines Parish, LA	Venture Global LNG	3.4	\$ 535
Calcasieu Parish, LA	Driftwood LNG	4.0	\$ 629
Nikiski, AK	Alaska Gasline	2.6	\$ 414
Average (Geometric)		1.4	\$ 223
Total		20.0	\$ 3,144

In total, there is 20 billion cubic feet per day of natural gas export capacity that has been proposed (nearly tenfold the [existing export capacity](#)), and awaiting approval under the NEPA process. The year-to-date average price of U.S. natural gas exports is \$5.25 per thousand cubic feet. At that price, the potential revenue from LNG exports from all these facilities is \$38.25 billion per year. The potential revenue loss of delaying the operation of one of these facilities by one month would average \$223 million, assuming a geometric mean (an average that resists being skewed by big or small projects). All ten of these facilities are in the process of creating an EIS and getting approval.

Power Plants

New power plants typically have an approval process that does not require NEPA, as NEPA is intended to facilitate compliance with federal policies that are not always applicable to power plants. However, there are 11 power plants that are awaiting decision under NEPA. This includes eight wind farms, a solar farm, a carbon capture coal plant, and a power plant that will generate using both solar and natural gas. The combined projects would have a nameplate capacity of 3.4 gigawatts, or more than one and half the capacity of Hoover Dam.

Proposed Power Plants			
Project Name	Type	Capacity (MW)	Potential Revenue (millions per month)
Wild Springs Solar Project	Solar	70	\$ 1.3
Roosevelt County Wind Farm	Wind	1230	\$ 28.2
Campbell County II Wind Farm	Wind	95	\$ 2.3
Palmer's Creek Wind Farm	Wind	44.6	\$ 1.1
Prevailing Winds Farm	Wind	100	\$ 2.4
Sand Creek Winds	Wind	75	\$ 1.7
Northern Wind Project	Wind	50	\$ 1.2
Wibaux Wind Project	Wind	100	\$ 2.2
Mohave County Wind Farm	Wind	500	\$ 13.0
Hydrogen Energy California	CCS	400	\$ 23.2
Clean Path Energy (NG)	Solar and Gas	750	\$ 26.4
Average (Geometric)			\$ 4.3

Total			\$ 103.2
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Based on the applicable retail price of electricity in each project's state, as well as capacity factors for the type of power plant, the potential revenue from one of these projects ranges significantly — between \$1.1 million per month and \$28.2 million per month. A geometric average shows a potential monthly revenue loss of \$4.3 million from delaying one of these projects.

Transmission Lines

Improving the state of electricity transmission in the United States is one avenue for lowering electricity costs and aiding clean energy growth. While overall grid reliability is satisfactory, an Energy Information Administration (EIA) report shows that a growing portion of electricity prices are [from rising delivery costs](#), while production costs have fallen significantly in recent years. This suggests that improved interconnectivity and transmission infrastructure has the potential for economic benefit by reducing the delivery costs, thus reducing overall costs of electricity consumption in the United States. Currently there are 15 projects tracked by DOE's NEPA status report that are related to transmission infrastructure improvements, accounting for about 1,266 miles of transmission lines.

Assessing the potential value of transmission projects is more complex than power plants or export terminals. While the voltage capacity of a project remains constant, the actual amount of electricity transmitted over the line—and consequently the anticipated revenue—varies substantially due to the length of lines, expected amperage, and capacity factors of connected power plants. However, for the few projects with available data, AAF came up with an estimated potential revenue based on national capacity factor averages and national average transmission costs (as reported by the EIA).^[2]

Proposed Transmission Projects			
Project	Voltage (kV)	Capacity (MW)	Potential Revenue (millions per month)
Northern Pass	300	1090	\$ 3.6
Vantage – Pomona Heights	230	500	\$ 2.5
Boardman – Hemingway	500	1000	\$ 4.9
Southline	115 – 345	1000	\$ 4.9
Estes – Flatiron	115		
Colusa – Sutter	500		
Nogales Interconnection	138		
Hills-Creek Lookout Point	115		
Big Bend – Witten	230		
Bonneville – Hood River	115		
Glen Canyon – Rogers	230 – 345		
Northern Loop	230		

Benton – Othello	115		
Parker-Headgate	161		
Hot Springs – Anaconda	230		
Average (Geometric)			\$ 3.8
Total			\$ 15.9

For projects with available data, the potential revenue per month may range between \$1.5 million and \$4.9 million. However, such estimates should not be applied too broadly. The above values are likely to be an overestimation, since more than a single transmission line is involved in the delivery of electricity, but the above values assume the entirety of transmission costs go to the affected project. The values, while not likely be exact, are intended to offer a ballpark figure for estimating the size of the projects.

Policy Solutions

High-value energy projects are caught up in protracted approval timelines under NEPA. This begs the question of why the review process is so long, and what can be done to shorten it.

While it may be tempting to merely mandate shorter review times, as was proposed in the [2015 RAPID Act](#), such rules may have little impact. At a fundamental level, the interest of the agencies performing NEPA review is to produce an assessment of sufficient quality that the federal government would prevail in any ensuing court case (the government does indeed [prevail in most NEPA-related litigation](#)). If agencies choose to comply with the deadline but do not produce a decision that is compliant with the legal requirements, then the associated project will likely face legal battles that would produce timelines no shorter than before, and perhaps more expensive for all parties involved. As such, it is necessary for any policy reform of NEPA to focus on the underlying reasons for prolonged timelines.

The Congressional Research Service (CRS), DOE, CEQ, and GAO have evaluated NEPA procedure, and identified some reasons for prolonged NEPA timelines.[\[3\]](#)

- Need for compliance with a growing list of underlying federal, state, and local regulations.
- Shortage of necessary expertise in coordinating agencies to conduct reviews.
- State Historic Preservation Officers not meeting deadlines.
- EA contractors failing to provide all necessary information with submitted EA drafts.
- Litigation brought against an EA or EIS, the most common reason being a failure to consider all “reasonable alternatives” for a proposed project.

The federal government has taken some actions that should shorten NEPA timelines.

- As part of the [2015 FAST Act](#), the statute of limitations on for NEPA-related decisions was reduced [from 6 years to 2](#).

- The FAST Act expanded the list of eligible coordinating agencies and lead agencies, which the CEQ notes has allowed for [earlier access to information](#) that would otherwise require interagency requests.
- President Trump’s executive order on energy independence rescinded prior executive orders that required NEPA reviews to consider greenhouse gas emissions from projects.

Some actions that the federal government has not taken, but could take to shorten NEPA timelines are as follows:

- Give lead agencies the authority to enforce project timelines. The current structure of interagency cooperation incentivizes careful assessment that complies with all aspects of the law, but there is no penalty for falling behind projected timelines.
- Further reduce the statute of limitations for NEPA-related litigation. CRS notes that the typical deadline for new litigation on environmental statutes is [60-120 days](#), much shorter than the 2 years allowed for NEPA. In California, environmental-related approvals have a [statute of limitations of only 35 days](#).
- Create positions that can provide technical guidance to federal agencies for conducting an EA or EIS.
- Provide clarification to the requirements to consider all “reasonable alternatives” for a proposed project. Under current law, the required considerations could theoretically be infinite, and it is not clear how much an EA or EIS needs to consider to satisfy this requirement.
- [Other recommendations tracked by CEQ for streamlining NEPA.](#)

These policies could alleviate some of the concerns expressed by CEQ and GAO, but there remain other issues that are less easily remedied. Data collation on NEPA compliance remains spotty, and is typically qualitative in nature, making proper cost-benefit analyses nearly impossible. Policymakers have little information on the quantitative benefits that NEPA has provided, and how those may compare to the costs. Better data uniformity and availability is needed, but may be difficult to achieve given the varying agencies involved.

Conclusion

A key goal of investing in infrastructure is boosting economic growth. But if it takes years simply to review a project prior to allowing its start — the benefits will be similarly delayed. Improving America’s infrastructure is about more than just investing more money; it is about removing the roadblocks to investments that will deliver improvements to American’s incomes and quality of life. A key challenge to this goal is the process by which the highest value projects are reviewed. NEPA was envisioned to expedite compliance with myriad environmental initiatives, but over time this process has become far more lengthy and burdensome largely because of expanding regulations that were not present at NEPA’s initial implementation. The current processes are not necessarily geared toward expeditious review – or even improving environmental outcomes. Instead, incentives are to ensure legal compliance. Of the 73 infrastructure projects in the DOE’s status report, at least half could also be considered as part of a clean or cleaner energy infrastructure. Unfortunately, the environmental review process may be a roadblock to good environmental policy.

Shortening the review times, which can take an average of 90 months to complete both an EA and EIS, will require several policy changes from the federal government aimed at reducing NEPA requirements, ensuring that agencies are sufficiently staffed to fulfill their duties, and shortening the statute of limitations for NEPA litigation to be commensurate with other environmental rulemakings. Until such changes occur, a massive

infrastructure investment is unlikely to have the hoped-for near-term economic growth effects.

[1] 73 projects is a figure taken from the list of projects under the August, 2017 DOE NEPA status schedule, and excludes projects that may be listed but are suspended, listed as regulatory notices or guidance, or supplemental listings for an already accounted for project; Estimated EA and EIS review times are a geometric mean of the time between EA determination and submission to states for EAs, and time between notice of intent/EIS determination date and final EIS notice of availability or final supplemental EIS notice of availability for EISs—projects not reaching those dates are not included, and projects having received a record of decision are not assessed.

[2] The estimated value is taken by applying the capacity factor of the connected plant to the expected capacity of the transmission line, and used to estimate the likely electricity generation on the line that would be subject to transmission tariffs (using the EIA's [estimated transmission costs](#)). When the power plant information is unavailable, an average capacity factor (weighted to reflect fuel diversity) is used instead.

[3] CRS report on NEPA streamlining <http://nationalaglawcenter.org/wp-content/uploads/assets/crs/RL33267.pdf> (2007); DOE Lessons Learned quarterly report <https://energy.gov/sites/prod/files/2016/03/f30/LLQR-March-2016.pdf> (2016); CEQ Fourth Cooperating Agencies report <https://ceq.doe.gov/docs/ceq-reports/Final-Cooperating-Agency-Report-Oct2016.pdf> (2016); GAO report “Little Information Exists On NEPA Analyses,” <https://www.gao.gov/assets/670/662546.pdf> (2014).