Free markets. Real solutions.

R Street Policy Study
No. 313
November 2024

State and Local Permitting for the Energy Sector: Challenges and Opportunities

By Devin Hartman, Josiah Neeley, and Philip Rossetti

Despite some case-by-case variance, overall, state and local permitting for energy infrastructure development appear to have become more restrictive than federal permitting.

Introduction

R Street recently concluded a series that evaluated state and local permitting challenges to various energy infrastructure types, with a focus on the resources needed for electricity generation.[1] That research was prompted by anecdotal evidence suggesting an overall worsening environment for the permitting of energy infrastructure at the state and local level. Our research confirmed this impression, though to different extents for different energy types. In this piece, we examine energy infrastructure types aggregately, rather than individually, to inform policy recommendations that are applicable to improving and expediting state and local permitting of energy infrastructure.

The Permitting Problem

Two simultaneous market forces are putting increased pressure on the market entry of new electricity generating resources and related infrastructure in the United States: rising electricity demand and the need to replace existing generation.

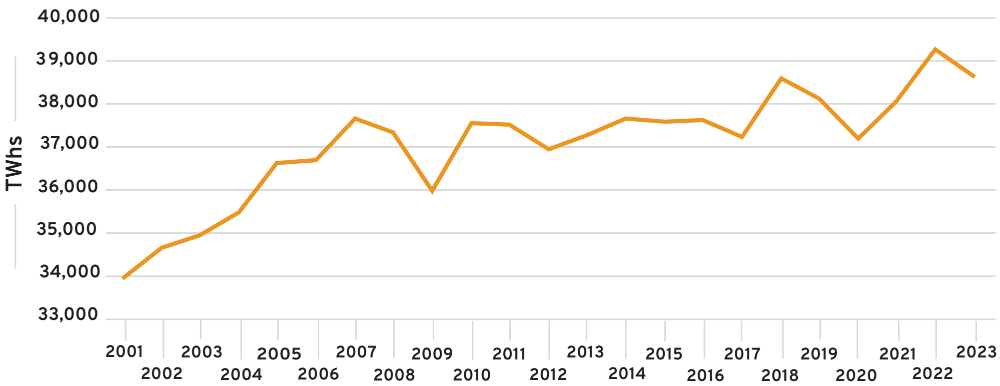
From 2010-2020, annual electricity consumption was relatively stagnant, with retail sales declining by about one percent over the same period.[2] But, as Figure 1 shows,

Table of Contents

1. Devin Hartman et al., "State Energy Infrastructure Permitting and Siting Series: Introduction and Methodology," R Street Institute, July 10, 2024. https://www.rstreet.org/commentary/state-energy-infrastructure-permitting-and-siting-series-introduction-and-methodology.
2. U.S. Energy Information Administration, "Electricity Data," U.S. Department of Energy, last accessed Aug. 15, 2024. https://www.eia.gov/electricity/data/browser/#/topic/5?agg=0,1&geo=g&endsec=vg&linechart=ELEC.SALES.US-ALL.A~~~&columnchart=ELEC.SALES.US-ALL.A~ELEC.SALES.US-RES.A~ELEC.SALES.US-COM.A~ELEC.SALES.US-IND.A&map=ELEC.SALES.US-ALL.A&freq=A&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=.

total electricity demand has been rising since 2020, increasing by 144 terawatt hours (TWhs), or 4 percent.[3]

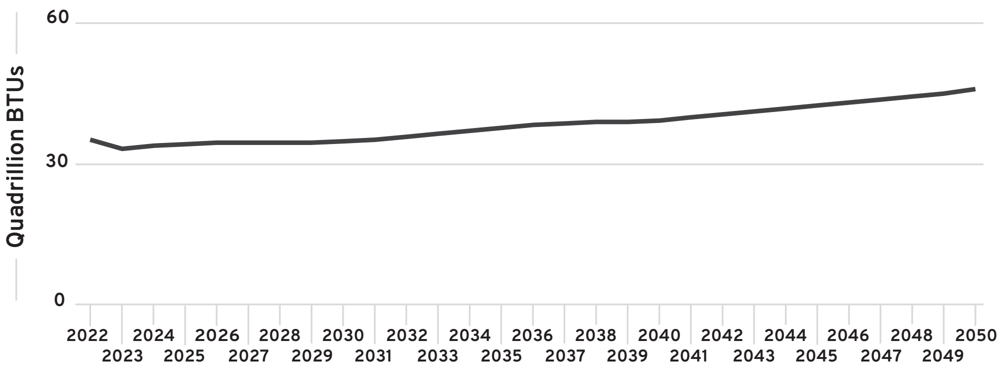
Figure 1: Retail Sales of Electricity in the United States



Source: U.S. Energy Information Administration, "Electricity Data," U.S. Department of Energy, last accessed Aug. 15, 2024. https://www.eia.gov/electricity/data/browser/#/topic/5?agg=0,1&geo=g&endsec=vg&linechart=ELEC.SALES.US-ALL.A~~~&columnchart=ELEC.SALES.US-ALL.A~ELEC.SALES.US-RES.A~ELEC.SALES.US-COM.A~ELEC.SALES.US-IND.A&map=ELEC.SALES.US-ALL.A&freq=A&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=.

After years of little need for new generating assets in the market, the United States now needs to increase generating capacity. Figure 2 depicts how electricity consumption is projected to further increase through 2050, when consumption could increase by 5.5 quadrillion BTUs—about 15 percent higher than today.[4]

Figure 2: Projected Electric Power Consumption



Source: U.S. Energy Information Administration, "Annual Energy Outlook 2023," U.S. Department of Energy, March 16, 2023. https://www.eia.gov/outlooks/aeo/data/browser/#/?id=2-AEO2023&region=1-0&cases=ref2023&start=2021&end=2050&f=A&linechart=ref2023-d020623a.119-2-AEO2023.1-0&map=ref2023-d020623a.3-2-AEO2023.1-0&ctype=linechart&sourcekey=0.

FIGURE 2 KEY TAKEAWAY

Electricity consumption is projected to further increase through 2050, when consumption could increase by 5.5 quadrillion BTUs–about 15 percent higher than today.

Replacing existing generation similarly adds pressure to market entry. Generation retirements are a function mostly of an aging generation fleet and, to a lesser extent, an increased policy focus on the reduction of greenhouse gas (GHG) emissions. The capacity-weighted average age of U.S. coal, natural gas, nuclear, hydropower, and oil-fired generation is over 40 years old.[5] By the end of 2021,

3. Ibid.
4. U.S. Energy Information Administration, "Annual Energy Outlook 2023," U.S. Department of Energy, March 16, 2023. https://www.eia.gov/outlooks/aeo/data/browser/#/?id=1-AEO2023&region=0-0&cases=ref2023&start=2021&end=2050&f=A&linechart=ref2023-d020623a.119-2-AEO2023.0-0&map=ref2023-d020623a.3-2-AEO2023.0-0&ctype=linechart&sourcekey=0.
5. Darren Sweeney and Anna Duquiatan, "As power plant fleet age holds at 28, US nuclear fleet hits middle-age milestone," S&P Global, Oct. 26, 2022. https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/as-power-plant-fleet-age-holds-at-28-us-nuclear-fleet-hits-middle-age-milestone-72411273.

31 states adopted some form of clean energy standard (CES).[6] In that same year, four states updated their CESs to be more ambitious.[7]

In addition to state-level policy mandates to increase electricity generation from clean energy sources that have not yet been deployed, there are also federal subsidies that incentivize investment in low-carbon electricity. Before the Inflation Reduction Act (IRA), the U.S. Treasury Department estimated the production and investment tax credits for clean electricity in 2023 would cost $4.2 and $3.7 billion, respectively.[8] After the IRA, the Treasury Department estimated the cost of these tax credits had increased to $7.5 and $26 billion, respectively—a 324 percent increase.[9]

While renewable energy production in the United States is increasing substantially, developers consistently report that it is taking longer to build and site resources, as well as associated infrastructure such as electric transmission lines. R Street has already produced research examining federal barriers to the construction of new energy projects, but the cause for delays in creating electric generating infrastructure often comes from states.[10]

The lack of suitable natural gas infrastructure has raised prices and pollution by forcing reliance on higher-cost resources, such as oil-fired power plants.

Artificial barriers, such as delayed permitting, stymie the market entry of new electricity generating resources, which translates to electricity consumers in the United States paying a higher price for energy. As an example, "transmission congestion" occurs when there is insufficient transmission capacity to transport the least-cost electricity generation to consumers, resulting in higher prices. In 2016, this transmission congestion cost $6.5 billion per year, but by 2022 had more than tripled to $20.8 billion.[11] In addition to transmission congestion, consumers often lack access to lower-cost electricity generating resources. The New England Independent System Operator (NEISO), for example, stated that the lack of suitable natural gas infrastructure in the region has raised both prices and pollution by forcing reliance on higher-cost resources, such as oil-fired power plants.[12]

There are often environmental impacts that accompany overly restrictive permitting policies. Some models suggest that 80 percent of the potential emission abatement projected from IRA subsidies are dependent on the growth of electric power transmission infrastructure.[13]

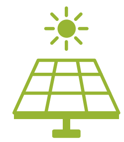
For these reasons, R Street examined state and local permitting considerations for infrastructure relevant to future generation and transmission of electricity, aiming to identify why state and local opposition to the permitting of new infrastructure has grown, and what policies might best address these roadblocks.

6. Richard Bowers, "Five states updated or adopted new clean energy standards in 2021," U.S. Energy Information Administration, Feb. 1, 2022. https://www.eia.gov/todayinenergy/detail.php?id=51118.
7. Ibid.
8. "Tax Expenditures," U.S. Department of the Treasury, Feb. 26, 2020, Table 1. https://home.treasury.gov/system/files/131/Tax-Expenditures-2021.pdf.
9. "Tax Expenditures," U.S. Department of the Treasury, March 11, 2024, Table 1. https://home.treasury.gov/system/files/131/Tax-Expenditures-FY2025.pdf.
10. Philip Rossetti, "Addressing NEPA-Related Infrastructure Delays," *R Street Policy Study* No. 234, July 2021. https://www.rstreet.org/wp-content/uploads/2021/07/FINAL_RSTREET234.pdf; Devin Hartman et al., "State Energy Infrastructure Permitting and Siting Series: Conclusion," R Street Institute, Aug. 15, 2024. https://www.rstreet.org/commentary/state-energy-infrastructure-permitting-and-siting-series-conclusion.
11. Richard Doying et al., "Transmission Congestion Costs Rise Again in U.S. RTOs," GridStrategies, July 2023, p. 3. https://gridstrategiesllc.com/wp-content/uploads/2023/07/GS_Transmission-Congestion-Costs-in-the-U.S.-RTOs1.pdf.
12. "Natural Gas Infrastructure Constraints," ISO New England, last accessed Sept. 25, 2024. https://web.archive.org/web/20240414164413/https://www.iso-ne.com/about/what-we-do/in-depth/natural-gas-infrastructure-constraints.
13. "Electricity Transmission is Key to Unlock the Full Potential of the Inflation Reduction Act," Princeton University Zero Lab, September 2022, p. 4. https://repeatproject.org/docs/REPEAT_IRA_Transmission_2022-09-22.pdf.

Findings from State and Local Permitting Research

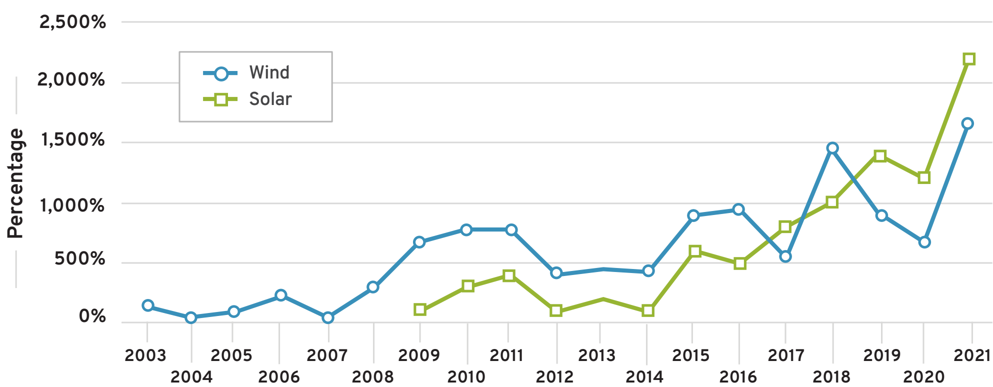
Unsurprisingly, we found that different types of generating assets and infrastructure face varying levels of state and local opposition to new construction. However, we did find that public favorability for specific resource types did not translate into local favorability. For example, in 2023, 75 percent of U.S. adults said they favor expanding wind turbine farms, and 82 percent said they favored expanding solar panel farms.[14] Despite this polling, our analyses, depicted in Figure 3, suggest that these resources have faced rapid increases in ordinances that have constrained their growth.[15]

In 2023, **75%** of U.S. adults said they favor expanding wind turbine farms



82% said they favored expanding solar panel farms.

Figure 3: Percent Change in Annual New Ordinances, Indexed to Start Year



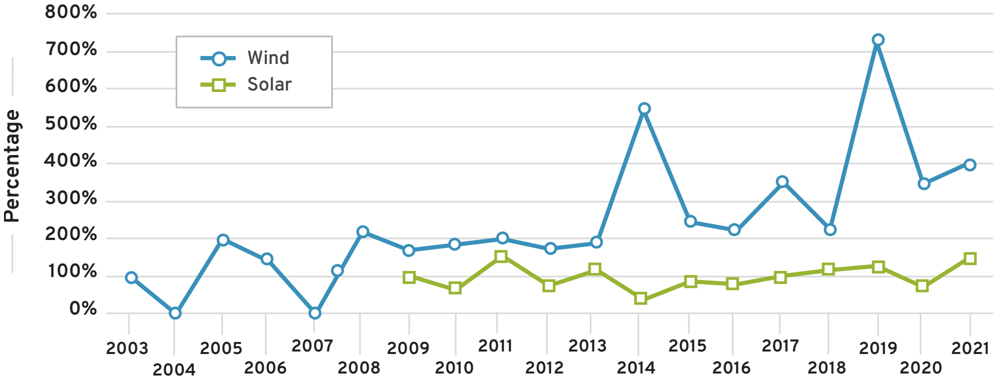
Source: R Street estimates based on National Renewable Energy Laboratory data. "NREL Releases Comprehensive Database of Local Ordinances for Siting Wind, Solar Energy Products," NREL, Aug. 9, 2022. https://www.nrel.gov/news/program/2022/nrel-releases-comprehensive-databases-of-local-ordinances-for-siting-wind-solar-energy-projects.html.

Importantly, we found that the stringency of new ordinances was not the same for wind and solar. As illustrated in Figure 4, wind, likely due to its noise and tall structures, faced increasing restrictiveness of new ordinances at the state and local level, while the less-intrusive solar farms have had little change in the restrictiveness of new ordinances.[16]

In contrast with wind and solar, nuclear power faces fewer restrictions from state and local permitting. Currently, 12 states have laws that restrict or prohibit the siting of nuclear power plants.[17] However, in recent years, six states have modified or repealed nuclear moratoria to allow for easier siting.[18]

14. Brian Kennedy et al., "Majorities of Americans Prioritize Renewable Energy, Back Steps to Address Climate Change," Pew Research Center, June 28, 2023. https://www.pewresearch.org/science/2023/06/28/climate-change-appendix.
15. Hartman et al., "State Energy Infrastructure Permitting and Siting Series: Conclusion." https://www.rstreet.org/commentary/state-energy-infrastructure-permitting-and-siting-series-conclusion.
16. Ibid.
17. Philip Rossetti and Josiah Neeley, "State and Local Permitting Restrictions on Nuclear Power," R Street Institute, July 18, 2024. https://www.rstreet.org/commentary/state-and-local-permitting-restrictions-on-nuclear-power.
18. "States Restrictions on New Nuclear Power Facility Construction," National Conference of State Legislatures, Sept. 28, 2023. https://www.ncsl.org/environment-and-natural-resources/states-restrictions-on-new-nuclear-power-facility-construction.

Figure 4: Percent Change of New Setback Requirements, Indexed to Start Year



Source: R Street estimates based on National Renewable Energy Laboratory data. NREL. https://www.nrel.gov/news/program/2022/nrel-releases-comprehensive-databases-of-local-ordinances-for-siting-wind-solar-energy-projects.html.

In the oil and gas sector, we found that pipeline infrastructure and permitting speed were related to resource production: Oil- and gas-producing states experienced pipeline growth and faster well permitting, while oil-and gas-consuming states had little-to-no infrastructure growth.[19] This was novel because rising oil and gas consumption lead to expectations of pipeline growth across all consuming states, but that did not occur. Our exploration of specific projects revealed that states could withhold permits of federally permitted infrastructure via Clean Water Act (CWA) permits, empowering states to oppose infrastructure that was not desired locally.[20]

We found similar dynamics present in electric transmission and geothermal power, where state and local permitting issues could easily snarl projects that were permitted at the federal level.[21] Additionally, disconnects between local perceptions around the benefits of infrastructure and overall public benefits exacerbated permitting delays and challenges.

Generally, we found that the local political economy played a significant role in state and local permitting policy. Resources that did not support long-term employment in the local community, like pipelines, transmission, wind farms, and solar farms, faced extraordinary permitting challenges. By contrast, nuclear power and oil and gas production, which sustain relatively large labor footprints, faced less restrictive state and local permitting environments. This suggests that if localities see tangible benefits from projects, such as local jobs, they are far more likely to view projects favorably.

Resources that did not support long-term employment in the local community, like pipelines, transmission, wind farms, and solar farms, faced extraordinary permitting challenges.

Practitioner Insights and Explanations of Observed Trends

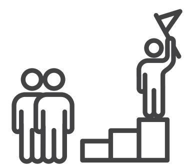
To get a better sense of what has motivated increased restrictions on permitting for different types of energy infrastructure, we conducted interviews with a variety of organizations that work on permitting in different states. This included 10 national trade associations and leading developers. In order to increase candor

19. Josiah Neeley and Philip Rossetti, "State and Local Permitting Restrictions on Oil and Gas," R Street Institute, July 31, 2024. https://www.rstreet.org/commentary/state-and-local-permitting-restrictions-on-oil-and-gas.
20. Ibid.
21. Hartman et al., "State Energy Infrastructure Permitting and Siting Series: Conclusion." https://www.rstreet.org/commentary/state-energy-infrastructure-permitting-and-siting-series-conclusion.

and insight, we structured these interviews without including attribution, hoping to emphasize qualitative insights and the political economy behind permitting battles. While the specifics of these dynamics varied from state to state and by energy type, a few general themes emerged from the discussion.

Regarding R Street's 2024 analysis series, practitioners generally agreed with R Street's problem statement on the relative salience of state and local permitting for infrastructure development.[22] About half of practitioner groups believed R Street's work understated the problem. In particular, they flagged the limitations of available data upon which the work was based. Practitioners noted that the National Renewable Energy Laboratory (NREL) database of state and local ordinances is valuable but out-of-date and not comprehensive; practitioners saw a far greater rise of state and local solar restrictions than the NREL database indicated.[23] Practitioners also noted poor data on natural gas infrastructure permitting, especially relative to available information on natural gas end-use bans.[24]

Practitioners emphasized that many states' permitting laws and practices explicitly or implicitly favor incumbents over non-incumbent developers.[25] They noted that some laws give incumbents expressed advantages, like preferential access to rights-of-way. Some permitting authorities and judicial review practices also favor incumbents' business models, which often finance projects through mandatory cost recovery from captive utility ratepayers. This is in contrast to independent, competitive developers who often finance through voluntary market mechanisms, which courts and permitting authorities sometimes consider speculative, despite the economic advantages. As an example, multiple practitioners raised the recent Illinois appellate court decision to reverse a permitting approval decision for the Grain Belt Express transmission project based on the financial model of the project. [26]



Practitioners emphasized that many states' permitting laws and practices explicitly or implicitly favor incumbents over non-incumbent developers.

Motivation for opposition to energy infrastructure permitting fell into two large categories. The first category involved quality of life, or what might be called "Not in my backyard" (NIMBY) concerns. Issues involving noise, disruptions relating to construction, or conflicts involving eminent domain fall into this category. NIMBY issues do not necessarily involve objections to a particular type of energy infrastructure but rather to the perceived or real negative effects on a local area that come from sitting the project in that area. While the specifics differ, all types of energy infrastructure raise these concerns to some degree.

Some practitioners noted more resistance from local stakeholders who were not directly affected landowners.[27] That is, landowners receive direct compensation, whereas non-land owner benefits are typically lower and less tangible. Thus "not-in-my-neighbor's-backyard" (NIMNBY) often better captures the sentiment of local resistance. Practitioners observed that land use concerns often stem from renters of agricultural land who, unlike landowners, have a one-sided view of the opportunity cost of land-use. This indicates a potential principal-agent alignment challenge when it comes to competing uses of leased agricultural land.

22. Author interviews with Practitioners A-J.
23. Author interview, Practitioner A.
24. Author interview, Practitioner B.
25. Author interview, Practitioner C.
26. Tammie Sloup, "Court reverses ICC order on Grain Belt Express project," FarmWeek Now, Aug. 8, 2024. https://www.farmweeknow.com/policy/state/court-reverses-icc-order-on-grain-belt-express-project/article_c1e93846-55b7-11ef-80fd-1f93cd892334.html.
27. Author interviews, Practitioners D-G.

The second category of objections was more ideological and involved more generalized opposition to a particular type of energy or energy infrastructure. For example, some individuals and organizations are opposed to the expansion of fossil fuel energy because of its association with climate change and other environmental problems and thus oppose the permitting of new infrastructure that would facilitate the continued use of fossil fuels, regardless of local specifics. Similarly, some people oppose new solar or wind projects for ideological reasons. Practitioners frequently cited political polarization of specific energy infrastructure, such as more campaigns to demonize fossil fuels or renewables, as intensifying more sentiment-based local opposition to projects.[28]

Practitioners emphasized a common thread between quality of life and ideological forms of project resistance: a reliance on false or baseless claims of potential harm. This can take many forms, with specious concerns including claims that projects would cause cancer, change weather patterns, and induce adverse health effects from electromagnetic fields. Practitioners noted the rise of various social media campaigns spreading such inaccurate material, often in opposition to specific types of energy.[29] Relatedly, social mechanisms amplify valid but sometimes exaggerated concerns, such as property and environmental risk of accidents and severe weather damaging energy infrastructure.

Practitioners frequently cited political polarization of specific energy infrastructure, such as more campaigns to demonize fossil fuels or renewables, as intensifying more sentiment-based local opposition to projects.

While quality of life and ideological categories of motivation can blend together, they are distinct, and result in distinctive geographic patterns of opposition. A wind turbine in a rural county, for example, may provoke far more opposition than an oil well in the same county, or vice versa.

Opposition to different types of energy infrastructure also tended to be organized in different ways. When it comes to fossil fuel-related infrastructure, practitioners noted the key role played by national environmental groups in organizing opposition to projects. While fossil fuel projects may generate local opposition, this opposition was often supported and coordinated by larger environmental groups.[30] By contrast, practitioners in many states indicated that opposition to solar and wind projects was more diffuse and occurred without substantial financial or organizational support from outside groups or interests.[31] These differences can have implications for the best policy responses to address and ameliorate local opposition to needed energy projects.

Policy Recommendations

The purpose of permitting is to ensure that net beneficial projects can be built in a timely manner while minimizing and addressing harmful side effects. As such, an ideal permitting process would be commensurate with what is needed to prevent demonstrable harms. In the energy realm, this can be difficult for several reasons. The benefits of new energy infrastructure often spread far beyond the state or locality that is responsible for permitting, and opposition to projects is also often based on non-local concerns. Adding to this are concerns that state and local offices relevant to permitting lack sufficient staff to adequately approve projects in a timely fashion.[32] For these reasons, the permitting process is always going to fall short of the ideal, but there

28. Ibid.
29. Author interview, Practitioner H.
30. Author interview, Practitioner D.
31. Author interviews, Practitioners E and F.
32. Linda Luther, "The National Environmental Policy Act: Streamlining NEPA," Congressional Research Service, Jan. 9, 2007. https://sgp.fas.org/crs/misc/RL33267.pdf.

are some reforms that could be implemented to help needed projects be completed and to shorten completion times. The following options should be considered:

Policy Recommendation 1

Tie permitting to specific harms, not politics. A recurring theme in our findings is that restrictions on the permitting and siting of energy projects is often untethered from the specific sorts of harms that permitting is supposed to protect against. For example, when it comes to setback required for wind turbines, we found that some jurisdictions have imposed highly restrictive setback ordinances even when there is little potential for wind generation in the area.[33] By contrast, more reasonable setback requirements are more correlated with wind potential. Likewise, restrictions on oil and gas pipelines seem more correlated with the local political environment than with specific risks from the pipelines themselves.[34] While the political discussion surrounding energy policy and the energy transition is legitimate, the permitting process should not be hijacked to pursue a broader political agenda. State policy should ensure permitting authorities' decisions are based on evidence of demonstrable harm, not speculation. Standing to challenge permitting decisions should also require a demonstration of tangible harms. Weeding-out specious claims via better processes and information is essential to improve the net benefits of permitting outcomes.

Policy Recommendation 2

Ensure local governments have needed information. A voluntary standardized package of permitting-related information should be developed so that developers can provide relevant information to state and local permitting bodies that may be understaffed. Project developers could use this to prepare permitting documents that have all information state/local permitting agencies need to make decisions. In developing this information, particular focus should be placed on including a more comprehensive accounting of the wider benefits arising from the project.

Policy Recommendation 3

Maintain fairness in permitting. Permitting and siting laws should give consistent and comparable treatment to incumbent and non-incumbent developers, as well as traditional and unconventional business models. This is a significant issue in some states when it comes to electric transmission and can be an issue with permitting for generators as well.[35]

Policy Recommendation 4

Create an appeal process to vindicate liberty. States should adopt appeals processes so that if local governments restrict market entry of resources—whether through general ordinances or via disapproval of specific projects—that are in the public interest without demonstrating sufficient impact to the local community, the affected parties can go to a higher authority for redress. This mechanism has been adopted in Indiana and proposed in other states as well.[36] While it is an imperfect solution, such a process not only helps account for the non-local benefits of projects, but also serves to better protect individual property rights. In making these determinations, state permitting agencies should be allowed to consider the interstate needs of energy infrastructure. This includes the out-of-state benefits of upstream and downstream linear infrastructure and regional reliability benefits of power plants.

33. Philip Rossetti and Josiah Neeley "State and Local Permitting Restrictions on Wind Energy Development," R Street Institute, July 10, 2024. https://www.rstreet.org/commentary/state-and-local-permitting-restrictions-on-wind-energy-development.
34. Ibid.
35. Josiah Neeley and Devin Hartman, "State Permitting Challenges: Electric Transmission," R Street Institute, July 30, 2024. https://www.rstreet.org/commentary/state-permitting-challenges-electric-transmission.
36. Jon Davis, "Wind, Solar and Siting: A Look at Recent Laws and Legislative Trends in the Midwest," CSG Midwest, Feb. 29, 2024. https://csgmidwest.org/2024/02/29/wind-solar-and-siting.

Conclusion

State and local permitting play a key role in the development of energy infrastructure. Our analysis has shown that state and local permitting for energy has been getting more restrictive in recent years, particularly for renewable energy. But while there are some commonalities across energy types, the permitting challenges are still varied. Therefore, any policy response must focus not only on the general features of energy permitting, such as the importance of energy for the economy and the costs of permitting delays, but also on the specific challenges that face each energy type in different regions of the country. Despite extensive case-by-case variance, in the aggregate, it appears that state and local permitting have become more restrictive on energy infrastructure development than federal permitting. Thus, state and local permitting and siting may present the largest categorical barrier to infrastructure development. Generally, reforms to large barriers to infrastructure development, like generator grid interconnection and federal permitting, are trending in a less restrictive direction. However, with the exception of nuclear, state and local permitting has trended in a sharply more restrictive direction. While state and local permitting is not always the largest impediment to building energy infrastructure in a timely manner, it has arguably become an essential issue to address in order to satisfy future energy demand.

Any policy response must focus not only on the general features of energy permitting, such as the importance of energy for the economy and the costs of permitting delays, but also to the specific challenges that face each energy type in different regions of the country.

About the Authors

Devin Hartman is the director of Energy and Environmental Policy at the R Street Institute. He formerly served as the president and CEO of the Electricity Consumers Resource Council and worked for the Federal Energy Regulatory Commission, Indiana Regulatory Commission, and the U.S. Environmental Protection Agency.

Philip Rossetti is a resident senior fellow in Energy at the R Street Institute. Before joining R Street, Philip was a fellow working with the minority staff of the Select Committee on the Climate Crisis and was director of Energy Policy at the American Action Forum.

Josiah Neeley is a resident senior fellow in Energy and the Texas Director at the R Street Institute. Prior to his work at R Street, he was a policy analyst with the Texas Public Policy Foundation and an attorney in private practice.