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Authors

Nilson, Robi
Tao, Lanbing
Maddock, Will
[et al.](#)

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EDITED BY

Gilbert Michaud,
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REVIEWED BY

Aparajita Datta,
University of Houston, United States
Maddy Kroot,
University of Wisconsin-Madison,
United States

*CORRESPONDENCE

Robi Nilson
✉ rnilson@lbl.gov

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Outcomes and timelines for state-based energy facility permitting in the United States

Robi Nilson^{1*}, Lanbing Tao^{1,2}, Will Maddock¹, Juniper Katz³,
Natalie Baillargeon^{1,3} and Ben Hoen¹

¹Berkeley Lab (DOE), Berkeley, CA, United States, ²Bren School of Environmental Science and
Management, University of California, Santa Barbara, Santa Barbara, CA, United States, ³School of
Public Policy, University of Massachusetts Amherst, Amherst, MA, United States

Permitting is a critical process shaping the pace, scale, impacts, cost, and distribution of energy supply. This study documents recent timelines and outcomes of state-based permitting processes for wind and solar projects across 19 states in the U.S. Ninety percent of projects obtained permit approval and most within a year or so of entering the process. State-level policies for permitting vary considerably, and two states (KY, MS) have substantially shorter average timelines than other states in our sample. Additional research is needed to identify factors responsible for the outcomes and timelines and clarify how different permitting regimes influence important factors such as public participation in permitting or the environmental impact of projects.

KEYWORDS

energy policy (US), energy supply, land use, siting and permitting, state policy

1 Introduction

The rules and processes for obtaining permission to construct and operate new large-scale energy facilities play an important role in shaping the pace, scale, impacts, cost, and distribution of energy supply. Two of the most critical processes for large-scale wind and solar project development are obtaining an agreement to connect to the transmission system, otherwise known as interconnection, and obtaining permission or a permit to construct the facility in a given location, which we refer to here as permitting. Permitting can include navigating complex land use regulations, environmental impact review, local ordinances, and incorporating public input. Developers cite interconnection and permitting as key causes of delays and cancellations (Nilson et al., 2024). While it is well documented that both wait times and costs for interconnection are substantial and increasing in recent years (Gorman et al., 2025; Rand et al., 2024; Seel and Kemp, 2023), there has been less empirical evidence regarding permitting. We ask, how do the timelines and outcomes of projects permitted under state authority vary across the U.S. and how does the length of time to permit vary by location, technology type, year of application, and project capacity?

Permitting policies and procedures for energy facilities on private land vary. Most states assign authority to local government, state government, or some combination of the two, but a few states have essentially no standard process or relevant regulations. See Table 1 for information on state permitting regimes included in our study. In about half of all states, the primary authority having jurisdiction (AHJ) is contingent on project size, with larger projects typically under state authority (Enterline and Valainis, 2024). Additionally, many states have recently reformed or are in the process of reforming their policies

TABLE 1 Table of state-level policies, solar and wind project counts, and approval rate.

State	Brief policy description	Relationship with local authority	Time limits	# Projects pending review	# Projects with outcome (permitted or canceled)	Approval rate (# permitted/# with outcome)
Kentucky	Contingent on size: facilities 10 MW or more are reviewed by the Kentucky State Board on Electric Generation and Transmission Siting.	Board cannot modify or waive local setback or decommissioning requirements	Must render decision within 180 days of application completion	2	37	100%
Mississippi	State and local: Mississippi Public Service Commission grants certificate of public convenience and necessity.	In most cases the project must first obtain agreement from local government.	Not found	3	31	97%
Maryland	Predominately state: facilities over 2 MW need certificate of public convenience and necessity from Maryland Public Service Commission.	The MPSC must consider recommendations from local government, but since 2019, the MPSC may preempt local zoning authority.	Not found	34	59	80%
Ohio	State/Local Hybrid, and contingent on size: solar facilities at least 50 MW, and wind facilities at least 5 MW need certificate of compatibility and public need from Ohio Power Siting Board.	Since 2021, the OPSB is not allowed to approve projects that the county has specifically precluded through zoning.	Must render a decision within 150 days of application completion, but this rule went into effect in 2025	4	61	80%
Minnesota	Contingent on size: solar facilities at least 50 MW, and wind facilities at least 5 MW are under principal responsibility of the Minnesota Public Utilities Commission.	Generally, preempts any local requirements or zoning	Must render decision within 1 year of application completion	10	22	86%
New York	Contingent on size: Since 2020 Office of Renewable Energy Siting has exclusive authority over projects of at least 25 MW	ORES must consider local requirements but can choose to deem them overly burdensome.	Must determine completeness within 60 days of receiving application. Must render decision within 1 year of completion.	18	43	91%
Other states	States with < 20 projects per state are either State/Local hybrid or contingent (CA, IA, ND, NH, NV, OR, SC, SD, WI, WY), predominately state (CT, WV), or Developer's choice (WA)			24	146	92%
Total				95	365	90%

Policy information adapted from [Breckel and Falkenburg \(2025\)](#); [Enterline and Valainis \(2024\)](#) plus original research conducted by authors.

([Breckel and Falkenburg, 2025](#)). State-level authority indicates that a state has either preempted local authority (in home rule states) or retained regulatory control over local land use regulation for the purpose of permitting energy facilities (in Dillon's Rule states)

([Aldag et al., 2018](#); [Fowler and Witt, 2019](#)). This centralization of authority has occurred in some states, in part based on the observation that under local control, resident preferences are more likely to have success in shaping decisions and/or preventing

development altogether (Katz and Baillargeon, n.d.). Anecdotal evidence has suggested that opposition groups in wind energy decisions have had more success where jurisdiction is local (Bohn and Lant, 2009; Ottinger et al., 2014). States may be motivated to reform policies therefore based on the expectation that state processes are more efficient and better at aligning projects with state clean energy goals which otherwise may be more difficult to achieve with local permitting (Elmallah et al., 2025).

To our knowledge, this represents the first-of-its-kind collection of project-level permitting data for state-based wind and solar energy facility permitting. The collection and analysis of these data provide novel empirical knowledge critical for understanding the pace, process, and eventual outcomes of state-based permitting regimes. Our permitting research is related to but distinct from research focused on local ordinances or zoning regulations which address the adopted rules that are applied by the jurisdiction when they consider projects (Aidun et al., 2022; Lopez et al., 2023). Instead, we capture dates and decisions from project permit applications and other publicly available information. Our permitting research is also distinct from prior research that primarily focused on delayed, contested, or blocked projects (Suskind et al., 2022; Aidun et al., 2022). Instead, we collect data on all projects permitted by state authorities across 19 states, regardless of outcome, which provides a more comprehensive picture of typical permitting processes, not just those of the most contentious projects.

The data collected are for permits that have little or no federal nexus and therefore do not involve federal permitting agencies. In the context of U.S. energy policy, debates around ‘permitting reform’ often focus on federal permitting policy and the National Environmental Policy Act (NEPA) (Bozuwa and Mulvaney, 2023; Fraas et al., 2025). However, federal permitting policy is most relevant to projects situated on federal lands, and to date less than 3 percent of all operating, utility-scale land-based wind, photovoltaic solar, and geothermal energy facilities are located on federal lands (Mai et al., 2025). Still, we recognize that consultations with federal agencies might be required as a part of some state reviews. In those cases, this consultation would be incorporated as part of the primary review by the AHJ, and any impact of that consultation would be reflected in the timelines and outcomes we report here. We discuss this possible limitation in more detail in our conclusion.

Our analysis reveals a few key takeaways. Ninety percent of projects obtained permit approval, most within a year or so of entering the process. These results support the conclusion that, at least in these data, permitting processes partially or fully adjudicated at the state-level are not preventing new potential energy from entering the grid. Variations in governance structures, procedures, steps, and quantity of applications all likely affect such timelines. Administrative capacity, including the availability of sufficient staff and the training or expertise of those staff, likely remains a critical part of states’ ability to process applications. This analysis cannot speak to outcomes relating to things like impact, community perception of process, cost, and other factors. Future research should attempt to measure dimensions of interest across permitting regime types.

2 Methodology

Compiling permitting data across jurisdictions is a time- and labor-intensive effort. This is primarily due to the nature of state permitting for this type of infrastructure, which is particularized to individual states and lacking a common standard for docket record keeping and public access of data.

We identified states with a state-based AHJ for permitting some or all large-scale energy facilities. This step was informed by recent publications documenting energy siting policies (Breckel and Falkenburg, 2025; Enterline and Valainis, 2024) and supplemented with our own research and communications with state agencies when necessary. We identified 41 states that met the criteria, where we then searched for state websites or databases that store permitting data. We identified permitting data for a total of 19 states, representing 46.3% (19 of 41) of relevant states, and a total of 460 projects. In those 19 states, we identified and recorded pertinent information for all proposed large-scale solar and wind facilities with a permit application date after January 1, 2018 for solar and January 1, 2015 for wind projects, and additionally all projects with a permit decision date after January 1, 2021 for solar or January 1, 2018 for wind. We restricted the data to these years to ensure we were capturing contemporary permitting timelines, and we expanded our timeline slightly for wind to increase the representation of wind facilities in our data given less wind development in recent years. We included hybrid energy facilities where available (e.g., solar + storage or wind + solar) facilities, but we did not seek data on standalone battery storage facilities. To our knowledge, we captured the universe of proposed projects in these 19 states that are subject to state-level permitting authority through our data collection cut-off date of January 1, 2025.

To gather the data, a research team searched and reviewed publicly available special permits and other documents related to projects and entered the dates and other variable parameters into a database.

Once data were collected, they were organized using relational database management software, PostgreSQL (v17, PostgreSQL Global Development Team 2025)/pgAdmin 4 (v9.0; pgAdmin Development Team 2025), and analyzed using R Statistical Software (v4.5.0; R Core Team, 2025)/RStudio (v.5.0, Posit Team 2025). The relational database structure was necessary because the permitting data exhibited complex hierarchical relationships, with individual projects often having multiple permit applications, decision stages, and regulatory interactions that could not be adequately captured in a flat data structure.

Finally, while we have data from 19 states, and those data contain the plausible universe of projects considered by those AHJs in our study period, for statistically relevant between-state comparisons in this paper we only considered states with a minimum of 20 projects with a known outcome. This limited us to 6 states for these between-state analyses. We group the remaining states together as a separate combined set for inclusion in these analyses.

3 Results

A key finding from our analysis is that 90% of projects considered by state-based authorities during our study period were granted permits. Among states with at least 20 project outcomes, the permit approval rate varied between 80% (Maryland, Ohio) and 100% (Kentucky) (Table 1). We further categorized project outcomes found in the data. Cancellations can be of four types. A project withdrawal refers to a developer-initiated removal of a permit application from consideration prior to an official decision being issued. As shown in Figure 1 (left), 8 out of the 19 states had at least one project withdrawn by the developer. The right panel of Figure 1 shows the counts of authority-driven decisions resulting in cancellation. Terminations refer to the authority deciding to stop considering the project prior to issuing a decision. Denials refer to negative decisions from the AHJ. Finally, one revocation of a previously approved permit occurred in North Dakota.

In Figure 2 we report on average permit timelines grouped by state. The overall average timeline from permit application to the state issuing a decision on that application is approximately 1 year. Of the six states with at least 20 projects, two are below this average by about 5 months (Kentucky and Mississippi), and four are above this average by about 3 months (Maryland, Ohio, Minnesota, or New York). A one-way analysis of variance to test whether the mean number of days differed among the seven state groups was highly significant $F_{(6, N-7)} = 19.40, p = 2.01 \times 10^{-19}$. Tukey's *post-hoc* pairwise comparisons yielded two distinct clusters with NY, MN, OH, and MD being significantly different ($\alpha = 0.05$) than KY, MS and "All other states" (See Supplementary materials for results table).

We also compared the permit decision time by application year, technology type, and project capacity and did not observe significant differences across these cohorts (see Supplementary materials).

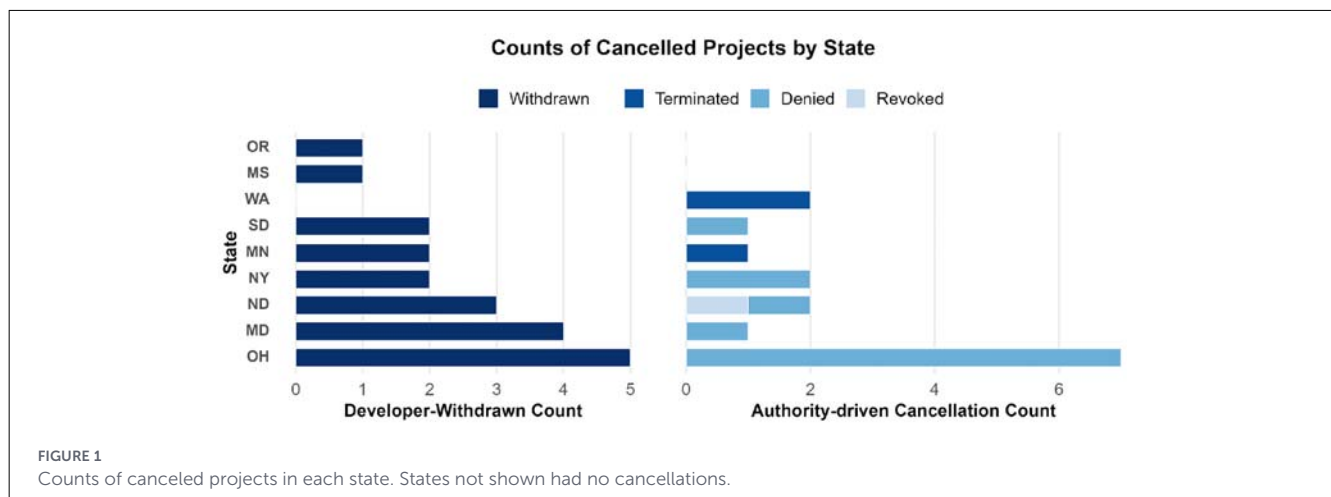
Figure 3 compares median timelines for three distinct permit stages for all data (bottom of plot) and across 12 distinct states. Four key dates in the permit process enable this analysis: Notice of Intent (a public notice by the developer prior to submission that they intend to submit a permit application), Application Submission, Application Completion (the date on which the authority deems the

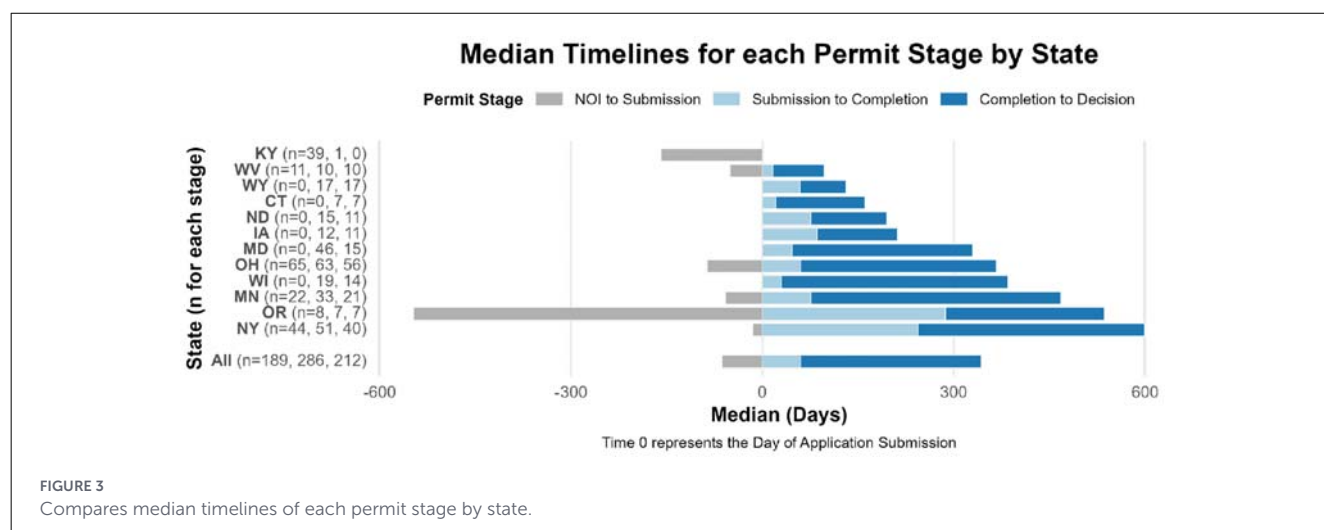
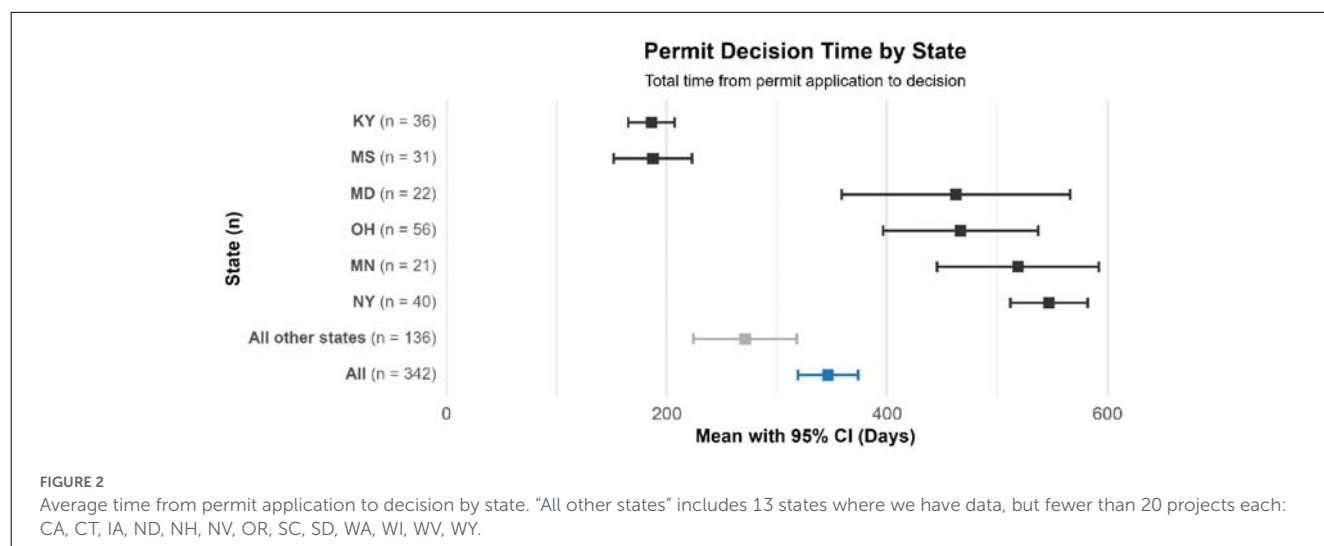
application complete and begins review), and Application Decision. Across most states, the longest stage of the process is the time from application completion to decision. In a few states (OR, NY), the median timeline for submission to completion is substantially longer than in other states, and Oregon also stands out with a long median timeline for Notice of Intent (NOI) to Submission. The minimal number of projects with data for these distinct permit steps limits our ability to make statistically relevant comparisons. Not all states require each of these distinct steps, and in other states, only a few projects have applied for state-level review. We provide results for any permit stage for which there are at least three projects represented.

4 Discussion

Despite permitting regimes that vary across states in important ways, we find high permit approval rates for state-permitting wind and solar projects across the country (Table 1). In the states with the highest observed permit approval rate for projects (Kentucky, Mississippi) the state-level boards are required to incorporate local preferences in making their decision. It is possible that most applicants only apply in these states after already having brought their projects into compliance with local regulations, which would help to explain the very high permit approval rate. In other states, approval rates are still relatively high, but there have been recent policy changes and more complicated relationships with local regulations. Minnesota, Maryland and New York typically preempt local authority, and it may be that developers in these states have proposed more projects with greater potential impacts with the hope that the state authority may be more likely to grant approval. These states also have state-level environmental regulations that could present challenges for certain projects. The Ohio state board is no longer allowed to preempt local authority, which may explain the 20% cancellation rate there (Hess et al., 2025).

Another factor in state-level permitting approval rates could be fewer opportunities for local opposition to result in permit cancellations. Permitting is often the avenue through which





opposition can play a direct role in success or failure of a project, as permitting procedures often require opportunities for public input or even directly allow veto opportunities (Aidun et al., 2022; Nilson et al., 2024; Stokes et al., 2023; Susskind et al., 2022). Some literature has suggested that local governments allow more opportunities for interested stakeholders (e.g., the public, environmental organizations) to impact the permitting process than state agencies do (Elmallah and Rand, 2022; Ottinger et al., 2014), which could help explain low denial rates at the state level. To better understand these trends, it is critical to explore how state-level permit approval rates compare to those observed at the local level and to conduct additional investigation of the exact reasons for project cancellations that were outside the scope of this study.

Developer-driven decisions to withdraw projects prior to a permitting decision may be similar to reasons for other cancellation types, but in the case of withdrawals, the developer observes that there is a high likelihood of permit denial or increased costs as some point during the permit review and opts to remove it from further consideration. The

level of opposition a project may experience can be difficult for developers to predict at the onset of a project (Nilson et al., 2024). The same is true for interconnection. Many more projects request interconnection than are built and wait times for connection requests typically last over 4 years and are unpredictable (Rand et al., 2024). Understanding the interactions and dependencies between interconnection requests and permitting will require project-level matching of these data, which was not available for this report but is recommended for future research.

There are various plausible explanations for why permit review timelines may vary. To date, this question has mostly been investigated at the federal level for projects on public land. In an analysis of US Forest Service NEPA review timelines, Fleischman et al. (2020) note the role of dramatically different administrative capacity across management units. Ruple et al. (2022) similarly find delays in Forest Service processing times relate to inadequate staffing or staff turnover, delays receiving information from permit applicants, or compliance with other laws. The same factors could lead to delays for state agencies though the policy

landscape for energy projects on private land is substantially more diverse. While implementation varies across management units, each is still subject to the same underlying federal environmental regulations. This is unlike the situation at the state level, where each state can have unique environment and land use policies. Our data does not allow us to understand exactly why timelines for permit review differ across states, but we expect that this is in part due to differences in underlying environmental policies or permitting agency responsibilities and focus areas. For example, in certain states in our sample, including Maryland, Minnesota, and Mississippi, the AHJ is the public service or utilities commission, which may place greater consideration on issues like ratepayer impacts or resource adequacy than an AHJ focused exclusively on renewable energy siting, such as in New York.

State AHJs have heterogeneous requirements around the time limits allowed for different stages of the permitting process (Table 1). Not all states have specific requirements around timelines, and not all states publicly record a decision about when the agency determines that the application materials are complete. However, in states that do have available data on permit stages, on average permits are in the phase of “completion to decision” longer than “submission to completion,” indicating that the AHJ spends more time reviewing the complete application than requesting or waiting on additional information from developers (Figure 3). In Oregon, the public is notified of an upcoming permit application typically at least a year prior to the application submission, and the agency review of applications for completeness takes approximately as long as reaching a decision. The “submission to completion” stage is also noticeably longer in New York than in most other states. This may be an indication that the permitting process is exceptionally onerous or challenging for developers to comply with in Oregon and New York, and clearer guidelines or standardization may be helpful, but we cannot be certain and this deserves further research.

This study does not consider projects subject to a local jurisdiction (i.e. county- or township-level permitting) or federal review. Local-level data is necessary to make comparisons between the outcomes and timelines of state- vs. local-level siting and would be highly relevant for informing policy. The ability to incorporate local-level permitting is severely limited by data availability and accessibility, but we expect this to be an important focus of future work.

In terms of federal reviews, there are two potentially relevant areas that could be explored. One, projects on public lands that have a federal agency as the primary permitting authority could be directly compared with state- and/or local-level timelines and outcomes. Federal permitting has been explored by other reports (Fraas et al., 2025), but the data is not currently in a format for easy comparison. Second, it is possible that state or local permitting could be impacted by federal policies when consultation with federal agencies is required, and we are unable to isolate the specific impact of those consultations on state processes here. Our research and experience in this area suggest that federal permitting policies have had minimal impact on the state-level permitting decisions that we are focused on here, although it is possible this could change in the future (Plumer, 2025). More broadly, changes to federal tax incentives are likely to change development patterns, but that impact is separate from the analysis of permitting authorities.

Understanding the federal policy nexus with permitting requires more research.

Finally, future research could better clarify causality of what specific factors led to permit cancellations or long timelines. For example, it is possible that state policies played a key role, such as state-required opportunities for public participation led to longer permitting timelines. Or the permitting process may take longer in some cases or lead to project cancellations because it is identifying problematic features of certain project proposals that would have worse social or environmental outcomes than projects that do achieve swift permit approvals. This study unfortunately cannot identify whether cancellations and timelines correlate with such project outcomes but provides a critical starting point for further investigation of these important issues. Such an investigation would require establishing metrics for social and environmental project outcomes and collecting such data across many projects over time to uncover potential causal relationships between permitting and outcomes.

Data availability statement

The datasets presented in this article are not readily available because all data collected for our dataset was from publicly available sources (e.g., state energy agencies). Our compiled dataset is not currently available for sharing without explicit permission from the funding agency. Requests to access the datasets should be directed to nilson@lbl.gov.

Author contributions

RN: Conceptualization, Formal analysis, Funding acquisition, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing. LT: Conceptualization, Data curation, Software, Validation, Writing – review & editing. WM: Data curation, Software, Validation, Writing – review & editing. JK: Conceptualization, Resources, Writing – review & editing. NB: Writing – review & editing. BH: Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Writing – review & editing.

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Conflict of interest

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fsuep.2026.1715811/full#supplementary-material>

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