CJP CLIMATE JUDICIARY PROJECT™

ENERGY AND LAW FOR JUDGES

Moving Energy: *Legal Dynamics of Infrastructure and Innovation*



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Moving Energy: Legal Dynamics of Infrastructure and Innovation

by Jim Rossi*

This module surveys key legal and regulatory issues surrounding the movement of energy. The module begins with a discussion of transportation of fossil fuels via pipelines. It then turns to critical issues surrounding electric power transmission planning, siting, and cost allocation. The implications of emerging energy technologies, including microgrids, distributed energy resources, storage, and hydrogen, are also discussed.

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I. Transporting Fossil Fuels

Energy in the form of fossil fuels has long been moved across vast distances by pipeline, rail, and ship. Each mode raises distinct statutory and jurisdictional frameworks, but common legal issues routinely emerge: the scope of environmental review, the use of eminent domain to assemble rights-of-way, the potential for liability from accidents and spills, and the tension between state and federal authority.

A. Gas Pipelines

Natural gas pipeline expansion has become a contentious legal issue, especially as the growth of fracking and the retirement of coal-fired power plants have expanded U.S. domestic natural gas production and use.

Under section 7 of the Natural Gas Act (NGA),[1] interstate natural gas pipelines must obtain a certificate of public convenience and necessity from the Federal Energy Regulatory Commission (FERC). Once granted, a Section 7 certificate confers upon a pipeline developer eminent domain power to take private (and even state-owned) land for a route—subject, of course, to "just compensation" under the 5th Amendment of the U.S. Constitution. While it is always controversial when a federal regulator affords eminent domain authority to a private pipeline developer, in *PennEast Pipeline Co. v. New Jersey*, the U.S. Supreme Court reasoned that by ratifying the Constitution, states accepted the federal eminent domain power, which the U.S. Congress then validly delegated to FERC certificate holders.[2]

Under the National Environmental Policy Act (NEPA), FERC—the lead agency for any interstate gas pipeline project—must evaluate a proposed pipeline's environmental impacts. In approving gas pipeline proposals, NEPA requires FERC to conduct an Environmental Assessment (EA) and, upon a finding of significant impact, a full Environmental Impact Statement (EIS) for the project. More than two decades ago the Supreme Court made clear that agencies conducting NEPA review are not required to consider environmental effects that are too far removed or outside their jurisdictional control, effectively limiting review to effects with a "reasonably close causal relationship" to the federal action.[3]

As climate science has consistently identified foreseeable carbon and climate impacts from the extraction, transportation, and use of fossil fuels such as natural gas, litigants have tested the extent to which the foreseeable climate impacts of new pipeline projects fall within the scope of NEPA's review requirements. Prior to 2025, lower courts were receptive to some of these arguments, but in *Seven County Infrastructure Coalition v. Eagle County, Colorado*, the Supreme Court cast doubt on the use of NEPA as the sole basis for requiring an agency to consider carbon impacts in pipeline siting.

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[1] 15 U.S.C. §717f.

[2] The Court held 5-4 that a FERC-certified gas company could condemn New Jersey's property, rejecting the state's argument that the Eleventh Amendment shielded it from eminent domain suits. PennEast Pipeline Co., LLC v. New Jersey, 594 U.S. 482 (2021).

[3] Dep't of Transp. v. Pub. Citizen, 541 U.S. 752 (2004) (holding that NEPA does not require an agency to analyze environmental effects over which it lacks statutory authority).

Seven County reversed a U.S. Court of Appeals for the District of Columbia (D.C.) Circuit decision holding that the federal Surface Transportation Board had violated NEPA by failing to sufficiently consider the reasonably foreseeable effects of increased upstream fossil fuels production and downstream refining activity that would be facilitated by a railway line that would ship crude oil. The Court emphasized that "NEPA is a procedural cross-check, not a substantive roadblock," and "[t]he goal of the law is to inform agency decisionmaking, not to paralyze it."[4] Agencies must evaluate the effects of the specific "proposed action" they are considering, the Court reasoned, but this does not include "other future or geographically separate projects that may be built (or extended) as a result of or in the wake of the immediate project under consideration."[5] In suggesting that a federal agency's NEPA review is entitled to "substantial deference," the Court also clarified that agencies are not required to analyze the environmental impacts of projects they have no authority over.[6]

Seven County will not, however, end legal challenges to the environmental and carbon impacts of federal pipeline approvals. Independent of NEPA's procedural requirements, the NGA delegates pipeline approval authority to FERC under a broad public interest standard. Though to date no court appears to have read the NGA to *require* FERC to evaluate downstream climate impacts in approving a gas pipeline, FERC would appear to *have the discretion to consider them* under the NGA's public interest standard, which is subject to arbitrary and capricious review by courts.[7]

To the extent that FERC has authority to deny permission for or place conditions on a pipeline for environmental reasons under the NGA, the authorization of a pipeline potentially may still be considered a legally relevant cause of downstream carbon emissions for purposes of project review under the NGA. Since the NGA requires FERC to determine the need for a new pipeline and the agency also has an obligation to address whether the pipeline is in the public interest, this may open the door to an argument that FERC should consider climate impacts under the NGA—completely independent of NEPA.[8]

FERC also has its own rules and guidelines related to pipeline "segmentation" and has obligations to not look too narrowly at the costs and benefits of pipeline projects when determining rates under the NGA. For example, an applicant cannot break a pipeline project into separate application submissions simply to avoid FERC's consideration of the overall impacts of the project. The carbon impacts of pipelines are thus likely to continue to be raised in challenges to pipeline approvals even after the deferential approach to NEPA review the Supreme Court endorsed in its 2025 *Seven County* decision.

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[4] 605 U.S. 168 (2025).
[5] *Id.* at 173.
[6] *Id.* at 169.
[7] Sierra Club v. FERC, 867 F.3d 1357, 1373 (D.C. Cir. 2017) (requiring analysis of downstream greenhouse gas emissions rested on NEPA, not the NGA, but grounding analysis in the NGA's public interest standard and reasoning that FERC could deny a pipeline certificate on the ground that the pipeline would be too harmful to the environment under its Section 7 public convenience and necessity authority). *See also* Birckhead v. FERC, 925 F.3d 510, 519 (D.C. Cir. 2019) (commenting in dicta on FERC's authority to consider downstream emissions as relevant to the NGA's public-convenience-and-necessity balancing).
[8] *See* Romany M. Webb, *Climate Change, FERC, and Natural Gas Pipelines: The Legal Basis for Considering Greenhouse Gas Emissions Under Section of the Natural Gas Act*, 22 N.Y.U. ENV'T L.J. 17 (2020).

Pipeline approvals also routinely present independent environmental concerns under the Clean Water Act (CWA). Under Section 401 of the CWA, a state can potentially block federal approvals by denying water quality certifications for projects that may harm state waters.[9] New York wielded this power to stop the "Constitution" Pipeline—a natural gas line that would extend from Pennsylvania's shale fields into New York. In 2016, the New York Department of Environmental Conservation denied Constitution's water permit after determining the pipeline failed to show it wouldn't pollute streams and wetlands. In upholding New York's decision, the U.S. Court of Appeals for the Second Circuit found "no basis" to disturb the state's decision, confirming that federal law entitled the state to conduct its own rigorous review of environmental impacts notwithstanding FERC's approval.[10] As New York's rejection of the Constitution pipeline demonstrates, even when Congress centralizes certain approvals (like interstate gas pipeline certification with FERC), states may still exert potential vetoes by raising issues with property rights or required environmental permits.

In a similar manner, required environmental approvals under the Clean Air Act (CAA) and the Endangered Species Act (ESA) can make or break a gas pipeline project. Compressor stations that pressurize gas along a pipeline route require air permits from state authorities acting under the CAA, and those permitting decisions are judicially reviewable—including for failure to consider disproportionate health impacts on nearby communities.[11] Pipeline construction also typically requires the U.S. Fish and Wildlife Service to issue a biological opinion and incidental take statement under ESA Section 7, and deficiencies in those documents can halt construction across the entire project.[12]

B. Crude Oil and Adjacent Product Pipelines

Unlike natural gas pipelines, oil pipelines lack a comprehensive federal siting regime and rely on state law for permitting, including eminent domain authority. Most states review oil pipeline applications under a public convenience and necessity standard. To the extent that the pipeline provides a "public use" (such as common carriage or the customer service obligations of a public utility under state law), pipeline developers are allowed to condemn private land (subject of course to "just compensation"). By statute, states almost uniformly recognize pipelines as eligible for eminent domain, but the threshold showing of public benefit (including the judicial willingness to second-guess it) can differ significantly across jurisdictions.

As an example of an expansive approach to public use, the Iowa Supreme Court upheld the use of eminent domain for the highly controversial Dakota Access crude oil pipeline. The court found that

[9] 33 U.S.C. §1341. A pending U.S. Environmental Protection Agency proposal would limit the scope of state-issued water quality certifications under Section 401 of the CWA to water quality impacts directly associated with discharges authorized by federal agency actions. This approach will test a more expansive statutory interpretation previously adopted by the Supreme Court. *See* https://www.regulations.gov/docket/EPA-HQ-OW-2025-2929; *PUD No. 1 of Jefferson Cty. v. Washington Dept. of Ecology*, 511 U.S. 700 (1994).

[10] Constitution Pipeline Co. v. New York State Dept. of Env't Conservation, 868 F.3d 87 (2d Cir. 2017).

[11] *See* Friends of Buckingham v. State Air Pollution Control Bd., 947 F.3d 68, 86 (4th Cir. 2020) (vacating Virginia's air permit for the Atlantic Coast Pipeline's Buckingham compressor station where the board failed to adequately assess environmental justice impacts on the predominantly African-American community of Union Hill and to consider electric-turbine alternatives).

[12] *See* Defenders of Wildlife v. U.S. Dep't of the Interior, 931 F.3d 339 (4th Cir. 2019) (vacating FWS' biological opinion and incidental take statement for the Atlantic Coast Pipeline).

even a pipeline mainly transporting North Dakota-produced oil through Iowa for primarily out-of-state delivery meets public use requirements under Iowa and federal law.[13] While the court recognized climate change concerns that opponents of the pipeline project had raised, it reasoned that these were policy questions for the political branches of government, not a legal hurdle to issuing a pipeline permit and conferring eminent domain authority to the pipeline as a public use.

The Dakota Access Pipeline controversy highlights how complexities can arise with oil pipelines when federal regulatory approvals are also implicated. Initially, a 1,172-mile pipeline from North Dakota to Illinois was stalled by massive protests and litigation. Federal courts ultimately found that the U.S. Army Corps of Engineers (the Corps) had violated NEPA by issuing permits without a full EIS for a crucial Missouri River crossing. In 2020, the District Court for the District of Columbia vacated the Corps' easement for the Lake Oahe crossing and even ordered the pipeline (then in service) to be emptied of oil pending completion of the EIS.[14] On appeal, the D.C. Circuit affirmed vacatur of the easement but reversed the shutdown injunction, holding that the traditional four-factor test for injunctive relief had not been met.[15]

The state pipeline siting framework is also increasingly becoming a means for adjacent products that may promote carbon reduction technologies. In *Texas Rice Land Partners v. Denbury Green Pipeline*, landowners challenged a pipeline intended primarily to transport carbon dioxide (CO_2) for the developer's own use.[16] The court established that a pipeline must show a reasonable probability that it will serve third parties in order to qualify as a common carrier with condemnation power. On remand, the developer was able to demonstrate contracts to ship others' CO_2, so the court ultimately found the pipeline met the public-use test.[17]

Also, in the Midwest, Summit Carbon Solutions proposed a multistate CO_2 pipeline network to transport captured emissions from ethanol plants to a North Dakota storage site. Lacking a federal siting framework, Summit sought state pipeline permits and began negotiating easements. Resistance was fierce. By 2023, Summit had filed over 150 eminent domain lawsuits against holdout landowners in South Dakota alone, provoking public backlash. South Dakota's governor ultimately signed a new law in 2025 banning the use of eminent domain for CO_2 pipelines, throwing the project's future into question. A legislative declaration that CO_2 pipelines are not a public use could signal a novel legal pressure point and highlights how efforts to promote carbon capture may potentially force reexamination of what public necessity means as technological and other changes are made to our energy system.

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[13] Puntenney v. Iowa Utilities Bd., 928 N.W.2d 829 (Iowa 2019).
[14] Standing Rock Sioux Tribe v. U.S. Army Corps of Eng'rs, 471 F. Supp. 3d 71 (D.D.C. 2020).
[15] Standing Rock Sioux Tribe v. U.S. Army Corps of Eng'rs, 985 F.3d 1032 (D.C. Cir. 2021).
[16] Texas Rice Land Partners, Ltd. v. Denbury Green Pipeline-Texas, LLC, 363 S.W.3d 192 (Tex. 2012).
[17] Denbury Green Pipeline—Tex., LLC v. Tex. Rice Land Partners, Ltd., 510 S.W.3d 909 (Tex. 2017). In *Hlavinka v. HSC Pipeline Partnership, LLC*, 650 S.W.3d 483 (Tex. 2022), the court held that a pipeline serving a single unaffiliated customer—which purchased the transported product from the pipeline owner's affiliate before it entered the line—satisfied the public-use requirement as a matter of law, suggesting that *Denbury*'s "reasonable probability" inquiry demands little more than one arm's-length shipping contract.

While pipeline safety standards are federal, within the United States, pipeline companies generally cannot hide behind federal preemption to avoid negligence claims for accidents.[18] Courts often allow traditional tort suits to proceed, on the theory that complying with minimum federal standards is not a shield against liability for failure to meet more exacting state standards.[19] As with fossil fuel producers, plaintiffs may seek to hold operators of fossil fuel pipelines liable as a public nuisance because of their contributions to climate change and other potential environmental harms. Such public nuisance claims brought in federal courts have been dismissed as raising nonjusticiable political questions or as preempted by federal environmental laws,[20] but similar state-based claims continue to be tested in state courts around the country (see Overview of Climate Litigation for a deeper discussion of these issues and cases). In its October 2026 term, the Supreme Court will consider whether federal law precludes state-law claims seeking relief for certain climate-related injuries.[21]

C. Oil and Coal Transport Regulation

The transport of fossil fuels by rail and ship raises parallel legal issues, albeit under different statutes. When the mid-2010s oil boom outpaced pipeline capacity, energy companies turned to railroads to move crude oil. A series of fiery derailments, such as the 2013 Lac-Mégantic disaster in Quebec, led to a public safety outcry.[22] However, states found their hands largely tied in directly regulating rail transportation of oil. The federal Hazardous Material Transportation Act (HMTA) broadly preempts state or local regulations "managing or governing" rail operations.[23]

For example, after a spate of derailments of volatile Bakken crude, the state of Washington enacted a law setting a volatility limit on crude oil shipped by rail into the state. In 2020, the U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA) declared Washington's rule preempted, concluding that it unreasonably interfered with nationwide hazardous material standards and the commerce of rail shipments.[24] The U.S. Court of Appeals for the Ninth Circuit agreed that federal law occupies the field of railroad permitting.[25] Similarly, federal courts have struck down on preemption grounds states' attempts to mandate minimum crew sizes or routing restrictions for oil trains. Risk mitigation for oil-by-rail has thus depended on federal measures (like upgraded tank car standards) and voluntary industry practices, rather than state or local ordinances.

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[18] For example, the Pipeline Safety Act preempts state safety regulation, but also states: "This chapter does not affect the tort liability of any person." 49 U.S.C. §60120(c) (formerly part of the Pipeline Safety Act of 1992, Pub. L. No. 102-508).
[19] *See, e.g.*, Stutler v. Marathon Pipe Line Co., 998 F. Supp. 968 (N.D. Ohio 1995) (negligence claim arising from pipeline accident not preempted).
[20] *See, e.g.*, Am. Elec. Power Co. v. Connecticut, 564 U.S. 410 (2011) (federal common-law public-nuisance claims for greenhouse gas emissions are displaced by the CAA's comprehensive regulatory scheme); City of New York v. BP p.l.c., 993 F.3d 81 (2d Cir. 2021) (state-law nuisance/trespass claims seeking damages for climate harms from fossil-fuel production and transport dismissed on displacement, foreign-policy, and political-question grounds).
[21] *See* Suncor Energy (U.S.A.) Inc. v. Cnty. Commn'rs of Boulder Cnty., No. 25-170.
[22] *See* Jessica Murphy, *Lac-Megantic: The Runaway Train That Destroyed a Town*, BBC (Jan. 19, 2018), https://www.bbc.com/news/world-us-canada-42548824.
[23] 49 U.S.C. §§5101-5127.
[24] *Hazardous Materials: The State of Washington Crude Oil by Rail Volatility Requirements*, 85 Fed. Reg. 29511 (May 15, 2020), *available at* https://www.federalregister.gov/documents/2020/05/15/2020-10381/hazardous-materials-the-state-of-washington-crude-oil-by-rail-volatility-requirements.
[25] *See* BNSF Ry. Co. v. Clark Cnty., Washington, 11 F.4th 961 (9th Cir. 2021).

Maritime transport of oil and liquified natural gas (LNG) is governed by a combination of federal and international law, leaving limited space for state regulation. Domestic shipments must comply with the Jones Act, which can encourage the use of less environmentally friendly domestic means of shipping oil.[26] Major oil spills from tankers (for instance, the 1989 *Exxon Valdez* spill) led to robust federal liability and safety regulation via the Oil Pollution Act of 1990, preempting many state-level rules (though states can impose additional liability up to certain limits).[27]

Siting of oil export or import terminals involves federal agencies (such as the U.S. Department of Transportation's Maritime Administration, MARAD, and the U.S. Coast Guard for deepwater ports) and often triggers environmental reviews under statutes like NEPA[28] and the Coastal Zone Management Act (CZMA),[29] where states have consultative roles. In practice, while a state cannot directly forbid oil tankers off its coast if federal permits are in order, states still may influence outcomes through the CWA, as well as in the exercise of their coastal permitting and public trust obligations. With LNG, however, FERC appears to have broad preemptive authority over states—though environmental review statutes like NEPA still apply.

II. Electric Power Transmission Planning, Siting, and Cost Allocation

Once electric power is generated—whether by solar, wind, nuclear, or fossil fuels—it is connected to load centers via high-voltage transmission lines and ultimately delivered to retail customers via lower-voltage lines that are typically owned by a local distribution utility. Historically, this was often handled by a single firm that operated as a vertically integrated utility, subject to regulatory oversight by a state utility regulator. However, with the rise of competitive interstate electricity markets, many power generators producing energy do not own transmission lines and transmission has become more of a national issue. Expansion of low-carbon power production, including solar and wind energy, is creating an urgent need to update existing transmission lines and to build new lines in areas where transmission has not previously existed, making this one of the most significant infrastructure issues facing the energy industry today.

A. Legal Oversight of the Transmission Grid

Legal oversight of the electric power grid is highly fragmented. In contrast to natural gas pipeline siting, where the NGA gives FERC the primary regulatory role in approving new pipelines, under the Federal Power Act (FPA) FERC has no authority over the siting of electric transmission lines that span across private property. Transmission siting approvals (including eminent domain authority) are

[26] 46 U.S.C. §55102. *See* Timothy Fitzgerald, *Environmental Costs of the Jones Act*, CATO POLICY ANALYSIS, Mar. 2, 2020, at p. 1, *available at* https://www.cato.org/sites/cato.org/files/2020-02/PA886_doi.pdf.
[27] 33 U.S.C. §§2701-2762.
[28] 42 U.S.C. §4332(2)(C) (requiring federal agencies to prepare an EIS for major projects).
[29] 16 U.S.C. §1456 (giving states a consultative "federal consistency" role in permitting of projects affecting coastal resources).

exercised almost entirely by state utility regulators and siting boards.[30] Not surprisingly, since a single state holdout can keep a transmission line from moving forward, many new transmission line projects that are needed to support sources of energy such as wind and solar (often located in areas distant from customer load) can experience significant delays. Property owner and state opposition to new transmission lines is often intense, and so too are the legal conflicts that can ensue.

While the regulation of transmission siting is highly fragmented, once an interstate transmission line is built, FERC supervises its operation under the FPA. Under the FPA, FERC has jurisdiction over the sale of energy at wholesale and electricity transmission facilities that are used in these interstate power sales.[31] FERC also has an obligation under the FPA to ensure that the rates for wholesale power transactions and transmission, including any terms and conditions related to wholesale sales, are just, reasonable, and nondiscriminatory.[32]

Since FERC's landmark Order 888 was issued in the mid-1990s,[33] federal policies have consistently embraced competitive wholesale markets as the primary tool for incentivizing and balancing the supply and demand for electric power on the grid. FERC has focused its primary regulatory efforts on removing barriers to entry for wholesale power markets, including barriers to transmission service, by regulating transmission lines to ensure that transmission access is provided to all sources of energy under open access principles that protect against discriminatory economic treatment.

For most customers in the United States, FERC has approved what are known as organized wholesale markets. These market areas do not always neatly map onto state geographic borders, but they include most of the Mid-Atlantic, New England, and Midwest states, as well as California and New York (see Figure 1). In organized markets, voluntary Regional Transmission Operators (RTOs) composed of transmission-owning utilities serve a role similar to an air traffic controller in managing the grid to ensure reliability. RTOs also operate wholesale electricity markets and oversee the planning for new regional transmission lines, subject to some FERC oversight. (Though small portions of Texas are in RTOs subject to FERC oversight, for most of Texas the state oversees the Electricity Reliability Council of Texas as a wholesale grid operator and power market independent of FERC.)

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[30] There are some narrow exceptions. For transmission projects on federal land, the U.S. Department of Energy (DOE) and FERC can coordinate with the U.S. Department of the Interior to approve a new transmission line, even over the opposition of the state where the line is located. In addition, DOE has some limited "backstop authority" to approve (and exercise eminent domain authority) over new transmission lines in so-called national interest corridors under the Energy Policy Act of 2005. Courts have interpreted this authority narrowly. *See* Piedmont Environmental Council v. FERC, 558 F.3d 304 (4th Cir. 2009).

[31] FPA §§201(a) & (b), 16 U.S.C. §§824a (a) & (b). This includes jurisdiction over all facilities necessary for such transmission and wholesale sales, but the FPA expressly reserves to states any other sale of energy (other than a wholesale sale), as well as facilities that are used for electric energy generation and distribution. *Id.*

[32] FPA §205, 16 U.S.C. §824d(a).

[33] FERC Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, 61 Fed. Reg. 21540, 21541-43 (May 10, 1996) (summarizing final rules designed to require open access nondiscriminatory transmission service in order to promote competitive wholesale power markets). FERC's authority to adopt this approach to electric power markets was upheld in *New York v. FERC*, 535 U.S. 1 (2002) (upholding Order No. 888 under sections 205 and 206 of the FPA).

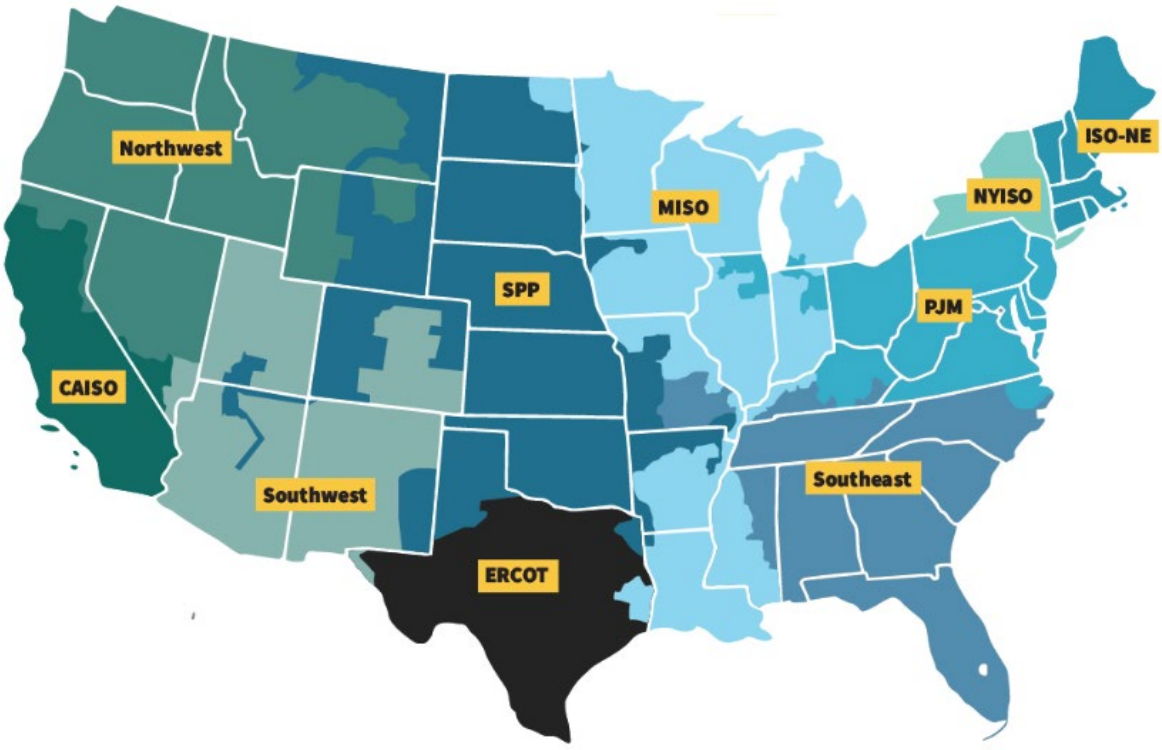


Figure 1. Map of RTOs and ISOs. Source: FERC, *RTOs and ISOs* (last updated Sep. 29, 2026), https://www.ferc.gov/power-sales-and-markets/rtos-and-isos.

Approximately one-third of customers live in areas of the United States where there are no organized wholesale power markets. This includes most of the Southeast and portions of the western United States (with the exception of California). In these areas, the sale of energy occurs primarily through bilateral agreements between power producers and utilities who need power to serve their customer loads. Vertically integrated utilities in these areas typically own transmission lines and are regulated directly by FERC, rather than through a voluntary RTO.

Utilities typically are authorized to participate in an RTO by a state legislature, and by its nature a state's decision to participate in an RTO requires ceding some basic decisions about transmission to the RTO. While RTOs increasingly play an important role in planning for new transmission lines, they notably have no direct eminent domain authority: They rely on their member utilities or non-utility developers to actually build lines, which must then secure rights-of-way and state siting approvals. This division of responsibility creates inherent regulatory coordination problems. In practice, even where an RTO identifies a multistate transmission line as crucial for reliability or congestion relief on the grid, each affected state (or sometimes each locality) can complicate (and potentially even block) a new line through its siting process, though state authority over transmission in RTOs is not unlimited.

B. Federal Preemption of State Determinations of "Need" and Cost Allocation for New Transmission Lines

The legal question of who decides "need" for a new line—regional authorities or state regulators—has come to the fore in recent litigation. Traditionally, states have had near-exclusive authority over transmission siting and permitting, a domain reserved to them by the FPA. FERC Order 1000 (2011) clarified that while FERC (through RTOs) oversees regional transmission planning and cost allocation, "siting, permitting, and construction" of transmission facilities remain state matters.[34] That state primacy has often meant that if a state commission finds a proposed line is not needed, or is not in the public interest because it does not provide benefits for its citizens, the project cannot proceed, even if the project has benefits for the regional grid.

Limits on the effective veto that states hold over new transmission lines are being tested, with particularly interesting recent developments in the U.S. Court of Appeals for the Third Circuit. PJM Interconnection, an RTO that spans 13 states along with D.C., approved a plan to build new lines easing grid congestion between Pennsylvania and Maryland. The approval was based on studies, conducted according to a method approved by FERC, that showed the project would produce market efficiency benefits that would save hundreds of millions in energy costs regionally, though it acknowledged that consumers in parts of Pennsylvania might see slightly higher prices as a result. The Pennsylvania Public Utility Commission (PUC) denied siting approval for the regional transmission line, chiefly because it deemed the line not needed for Pennsylvania's own needs and potentially harmful to Pennsylvania ratepayers.

Transource, the developer, sued in federal court, arguing, inter alia, that Pennsylvania's denial of the new line based on a narrow assessment of need is preempted under the Supremacy Clause of the Constitution. The Third Circuit accepted this argument, holding that once a regional transmission plan has determined a project is needed on the basis of interstate benefits quantified in accordance with FERC standards, a state cannot reject the line solely by second-guessing that need. The court emphasized that Congress, via the FPA, gave FERC authority to identify transmission needs and solutions; a state cannot "veto" a project just because the benefits accrue mostly out-of-state.[35] Of course, Pennsylvania remained free to deny the line for traditional siting reasons—like environmental or health and safety concerns—but not for lack of need or purely local economic reasons.

The court reasoned that the PUC's rationale as stated presented an "obstacle" to federal purposes under the Supremacy Clause.[36] While limited as precedent to the Third Circuit, this decision is potentially groundbreaking. It opens up new possibilities for litigants to challenge state denials of siting for new regional transmission lines, as well as cost allocation for these lines, on federal preemption grounds. To the extent a state relies on its own assessment of a proposed line's costs or benefits in refusing to site a transmission line where FERC or an RTO has already answered that question, state regulators are more likely to face a preemption challenge.

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[34] *Transmission Plan. & Cost Allocation by Transmission Owning & Operating Pub. Utilities*, Order No. 1000, 136 FERC ¶ 61051 (2011).
[35] Transource Pennsylvania, LLC v. DeFrank, 156 F.4th 351 (3d Cir. 2025).
[36] *Id.* at 376.

A related preemption issue is customer cost allocation for new transmission investments.[37] New transmission lines produce regional benefits, but some customers may benefit more from a new line than others. In organized markets, cost allocation for a new line is typically approved by an RTO, subject to FERC's oversight. If FERC determines that a cost allocation approach is just, reasonable, and nondiscriminatory, this preempts a state regulator from second-guessing this determination in overseeing retail rates.[38] Courts have construed FERC's primary role here as policing rates under a "cost causer pays" principle, which requires some articulation of whether a customer benefits from a regional line before allocating the costs of that line to the customer.[39] The determination of just and reasonable rates is a matter of exclusive federal jurisdiction,[40] but states still oversee the prudence of a utility's investment (and many business operation) decisions in setting retail rates.

State regulators thus still have an important role to play in setting a resource balance for customers (including meeting carbon reduction goals) and evaluating a utility's business decisions related to investment in non-transmission programs (such as energy efficiency or demand reduction) or in building new generation versus purchasing power in the wholesale market. States also have an important role to play in assessing a line's environmental and land use impacts. As states continue to explore alternatives to expanding interstate transmission lines as a way of ensuring sufficient power to provide reliable energy to customers within their borders, new legal conflicts surrounding preemption in cost allocation are likely to arise.

C. Dormant Commerce Clause and State Refusal to Support Regional Transmission Lines

Another notable legal battleground in regional markets is state right-of-first-refusal (ROFR) laws related to construction of new regional transmission lines. FERC Order 1000 found a federal ROFR for incumbent utilities in RTO planning to be discriminatory—once a needed project is identified, the RTO's planning for a new line must be open to competition from any qualified developer rather than automatically handed to the incumbent utility at the state level.[41] In response, several states (Minnesota, Texas, Iowa and others, primarily in midwestern and western states) enacted statutes granting incumbent utilities a ROFR for purposes of constructing new lines within their borders.

As an example, a 2019 ROFR law enacted by the Texas Legislature flatly barred any new entrant from building transmission lines that connect to existing Texas facilities, effectively excluding out-of-state

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[37] These new investments can, and often do, include interconnection facilities for power producers and for customers, such as large data centers.

[38] Hughes v. Talen, 578 U.S. 150 (2016).

[39] As one federal court has put it, the costs allocated to customers for new lines must be "roughly commensurate" with their benefits. Ill. Com. Comm'n v. FERC, 578 F.3d 470, 477 (7th Cir. 2009).

[40] Nantahala Power & Light v. Thornburg, 476 U.S. 953 (1968).

[41] *See* FERC Order No. 1000, *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, 76 Fed. Reg. 49842, 49876 (Aug. 11, 2011) (codified at 18 C.F.R. pt. 35) (calling for regional transmission planning processes that take account of transmission needs driven by public policy requirements, and finding a federal ROFR to be discriminatory). FERC has continued this approach in its most recent transmission planning rule. *See* FERC Order No. 1920, *Building for the Future Through Electric Regional Transmission Planning and Cost Allocation*, Order No. 1920, 187 FERC ¶ 61068 (2024), *available at* https://www.ferc.gov/media/e1-rm21-17-000.

companies from building within Texas' portion of the interstate grid. This was soon challenged by NextEra Energy, which had been selected by the Midwest Independent Service Operator (MISO, an RTO serving a small portion of the state), to build a line in east Texas. In *NextEra Energy Capital Holdings, Inc. v. Lake*, the U.S. Court of Appeals for the Fifth Circuit held that Texas' exclusion of non-incumbents likely violates the Dormant Commerce Clause.[42] The law was essentially a residency (or in-state presence) requirement for builders, which the court said "plainly" favors in-state entities. Following *NextEra*, ROFR laws may be constitutionally suspect if they are grounded in protectionist motives or overtly block out-of-state competitors.

The Fifth Circuit stopped short of a final merits ruling but its opinion signals deep skepticism of Texas' justifications. Texas argued it was ensuring reliability by using experienced local utilities, but NextEra Energy, the out-of-state entity selected by MISO to build the line, pointed out that it operated thousands of miles of lines elsewhere and that Texas' real aim was to protect incumbents from competition. Notably, the Fifth Circuit distinguished Texas' situation—as part of the MISO interstate grid—from purely intrastate regions (like ERCOT, the transmission operator for most of Texas) that might not trigger Dormant Commerce Clause scrutiny because no interstate market is involved. While the Texas ROFR law has not been repealed, a later U.S. district court blocked Texas from enforcing it in the portions of the state with organized markets.[43]

Given the many legal and regulatory obstacles to building new lines, transmission developers have sought ways to maneuver around state siting requirements. One example is the Grain Belt Express, a proposed 800-mile high-voltage direct current (HVDC) line to ship wind power from Kansas to load centers in Missouri, Illinois, and Indiana (see Figure 2). Without federal eminent domain authority, Grain Belt had to secure state-by-state approval, and the line has been the subject of more than a decade of regulatory squabbles across several states.

[42] NextEra Energy Capital Holdings, Inc. v. Lake, 48 F.4th 306 (5th Cir. 2022).
[43] NextEra Energy Capital Holdings, Inc. v. Jackson, 756 F. Supp. 3d 429 (W.D. Tex. 2024).

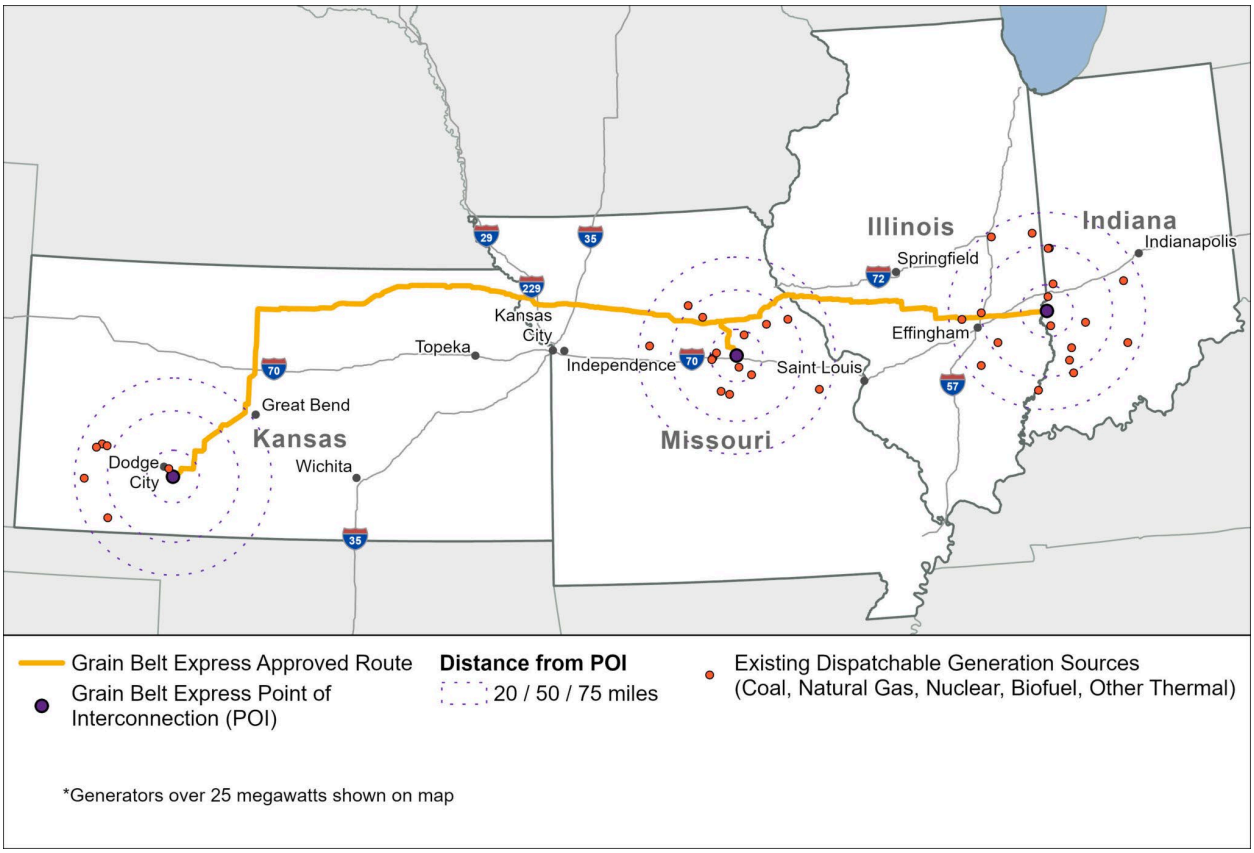


Figure 2. Proposed Grain Belt Express HVDC Transmission Line. Source: Grain Belt Express, https://grainbeltexpress.com/.

In Missouri, initial resistance to this line was especially fierce: landowners and some lawmakers argued that a private merchant line serving mostly out-of-state customers was not a public use. After protracted litigation, the Missouri Supreme Court in 2018 upheld the line's "certificate of convenience and necessity," noting the project's broad regional benefits and commitments to deliver some power to Missouri municipalities.[44] Missouri's Legislature then passed a compromise law requiring 150% compensation for any easement taken for such projects—increasing landowner payouts but tacitly acknowledging the line's legitimacy.[45]

Grain Belt (owned by Invenergy) had acquired most parcels voluntarily, but also faced an unusual county-level roadblock: one rural county tried to deny permission for the line to cross local roads. In October 2024, a Missouri appellate court ruled the county could impose reasonable conditions on how the line crosses roads, but could not withhold consent altogether, because the state utility commission's approval of the route preempted any local attempt to block it.[46] The court interpreted

[44] Grain Belt Express Clean Line LLC v. Pub. Serv. Comm'n, 555 S.W.3d 469 (Mo. 2018).
[45] Mo. Rev. Stat. §523.262 (2022).
[46] Grain Belt Express, L.L.C. v. Chariton Cnty., 703 S.W.3d 642 (Mo. App. W.D. 2024).

Missouri law as allowing counties to coordinate on technical specifications but not to veto state-authorized projects. This reaffirmed the general principle that state-level approval trumps local obstruction in utility siting—a principle that holds in many states, though the specifics vary. Some states require affirmative county assent for transmission lines (Minnesota, for instance, or as Missouri law once did until clarified by the courts), whereas others preempt local zoning entirely for major energy infrastructure.

In Illinois, the project faced similar challenges. In early 2026, the Illinois Supreme Court held that state law authorized this line, against objections from opponents who claimed the Grain Belt Express developer was not a public utility and lacked ratepayer financing for its project.[47] There is considerable variation in how states define public utilities under their siting laws, but as the Missouri and Illinois examples illustrate, at the state level, eminent domain remains a fundamental issue: any major transmission corridor will face holdouts, and without federal authority, state condemnation processes must do the work. As seen with the Grain Belt Express line, states can facilitate this by clarifying that such projects are public uses and by ensuring landowners are generously compensated (e.g., Missouri's 150% of market value rule). The legal challenge is to enable the grid of the future—likely a more meshed, national grid to support increased demand for firm power to serve data centers, along with a more diverse range of clean energy resources—while still respecting property rights and local interests.

Shifting to federal law, a statutory regime that was built for a vertically integrated, slow-growing system where projects were primarily managed by state regulators to meet in-state customer needs is straining under increasingly regional wholesale power markets, rapid load growth associated with data centers, and significant growth in utility-scale renewable energy projects that need access to transmission. RTOs have facilitated wholesale markets and provided a platform for interstate coordination, but they continue to lack final say on the ground. Recent judicial decisions like *Transource* and *NextEra* suggest courts are willing to recalibrate the federal-state balance to unclog bottlenecks in transmission development, within constitutional limits. For judges approaching these federalism disputes, the key pressure points will be reviewing how far federal regulations can go to support cooperative planning without commandeering states; assessing claims of discrimination or preemption in state laws; and adjudicating the inevitable disputes over cost-sharing for projects that create winners and losers.

III. Resilience: Microgrids and Distributed Energy Resources

The traditional electric power model centered on large, centralized generation (e.g., big power plants) feeding consumers via a hub-and-spoke grid. Today, that model is evolving to include more distributed energy resources (DERs), such as rooftop solar, battery systems (in some cases allowing customers to serve as "virtual power plants"), and small wind or gas units. Microgrids—a finite cluster of interconnected customers and distributed energy resources (such as a campus or business park) that is managed and coordinated as if a single entity with respect to the larger grid—are also increasingly common, driven by falling technology costs and the pursuit of resilience against outages (see Box 1).

[47] Concerned Citizens & Prop. Owners v. Ill. Com. Comm'n, 282 N.E.3d 388 (Ill. 2026).

This transition from centralized toward distributed raises novel legal questions: Who can generate and sell power? Under what regulatory regime do microgrids fall? How are reliability and safety maintained when power flows become bidirectional and fragmented? Judges, especially state judges, are likely to see cases that pit innovative distributed energy projects against century-old franchise rights and utility regulations.

A. Microgrids and Resilience on the Distribution Grid

Microgrids stand to offer many benefits to the grid, but the legal frameworks for allowing microgrids vary across jurisdictions and are often uncertain. If a company installs solar panels or a generator and then sells electricity to a neighboring property via a private wire crossing a street, in many states, this would be considered an unauthorized public utility operation. In many states, including some states that participate in organized markets, utilities have exclusive rights to sell electricity to retail customers in a geographically defined service territory and to use public rights-of-way for distribution lines. If not carefully structured, arrangements to purchase energy from a DER provider can run afoul of utility laws.

Box 1. What Is a Microgrid?

Microgrids are localized energy networks, where local power sources (like solar panels, wind turbines, or natural gas generators) are grouped together into a single, controllable entity that can either connect to the larger grid or work in an isolated "island mode." Microgrids can help to integrate intermittent renewable energy sources like wind and solar and can cover an area as small as a city block or as large as a university campus, military base, or airport. Many microgrids operate with storage, allowing an effective islanding from the rest of the grid, while some others operate without storage and thus require synchronous operation with the surrounding power grid.

Microgrids are subject to many of the same requirements as traditional utilities, including state PUC's rate setting, FERC or RTO/ISO-managed wholesale electricity transactions, and local siting or zoning authorities. While local laws and regulations may limit who can own or operate microgrids, and utilities or other grid operators may be reticent to encourage microgrid development since it could cut into generation and distribution revenue streams, some municipalities are promoting them. Pittsburgh, Pennsylvania, for example, created a plan in 2015 to establish a network of interconnected microgrids to increase energy reliability and modified its zoning requirements to enable deployment. The Pittsburgh International Airport microgrid (powered by natural gas and solar) now generates more energy than it uses on a daily basis.

A recurring legal tension is between incumbent utilities' duty to serve and DER providers' desire to serve niche markets. Utilities argue that allowing others to supply power to customers cherry-picks profitable load and leaves the utility (and its remaining ratepayers) worse off, potentially raising rates for those still fully reliant on the utility. Since not every state has enacted microgrid legislation to encourage non-utility investments in energy resources that can provide flexibility and contribute to grid resilience (hence promoting reliability), courts may need to interpret traditional utility laws to determine what approaches are allowed.[48]

In North Carolina, for example, a nonprofit attempted to install a solar array on a church and sell the church power under a third-party agreement; the state utilities commission—affirmed by the courts—found this violated the utility's exclusive service rights (North Carolina did not allow third-party power sales except under limited circumstances).[49] Some states have adopted new legislation to allow certain microgrids or campus arrangements under exemptions, though many of these require that the microgrid serve contiguous properties under common ownership or through a municipal/coop structure.

B. DERs in the Wholesale Market

Most DERs operate behind the meter, or on the distribution grid only. Increasingly, however, DERs are becoming important to wholesale markets too. Some RTOs have capacity markets (long-term markets aimed at promoting investment in new power generation projects to promote reliability) that require load-serving entities to procure sufficient generation to meet future customer demand. A growing legal pressure point for DER growth is the extent to which DERs are able to fully participate in wholesale capacity markets. If customers install solar and reduce their dependence on the grid, should the utility be able to count that toward generation capacity, and under what verification terms? Some states (like New York) have tried to integrate DERs into their resource adequacy planning. Others worry that too much behind-the-meter generation will undermine the centralized procurement of capacity, leading to either a costly surplus or shortfall.

On their own, many renewable energy projects face practical hurdles to participating in wholesale markets, since a solar or wind project in isolation may not be able to offer guaranteed delivery of power 24/7. But through a process known as "aggregation," commitments to deliver energy from DERs can be bundled and sold into the wholesale market as capacity, allowing renewable projects to combine and offer more reliability value for the wholesale market.

In Order No. 2222 (2020), FERC required RTOs to facilitate the participation of aggregated DERs in wholesale markets. FERC's rules prohibit RTOs from broadly excluding DER aggregations for the

[48] Contrast SX Enters., Eagle Point Solar v. Iowa Utilities Bd., 850 N.W.2d. 441 (Iowa 2014) (taking a precompetitive approach to the definition of a public utility to allow third-party solar), with PW Ventures, Inc. v. Nichols, 533 So.2d 281 (Fla. 1988) (applying Florida's public utility laws broadly to a transaction involving the sale of energy even to just one customer, absent an express legislative exception to the contrary).

[49] State ex rel. Utils. Comm'n v. N.C. Waste Awareness & Reduction Network, 805 S.E. 2d 712 (N.C. App. 2017).

mere reason that they are on the distribution-side of system.[50] FERC stopped short of forcing any unwilling individual resource to participate—it simply opened the door for those that do—but many state regulators saw this as FERC intruding into distribution management. As of 2025, implementation is underway, and initial compliance plans give states a role in reviewing whether distribution-connected resources can provide services reliably.

The jurisdictional tension surrounding DER aggregation presents issues similar to those courts addressed in challenges to FERC's demand response and energy storage rules and Order 841 (on storage, discussed below). Resolving these jurisdictional conflicts will require regulators and judges to parse the FPA's jurisdictional line: does FERC's rule "directly affect" wholesale rates and is it tightly focused on wholesale transactions (thus permissible), or is it regulating the local distribution facilities or retail programs (thus overreaching)?[51] The D.C. Circuit's approval of Order 841 suggests FERC is on firm legal ground so long as it is only regulating the wholesale transaction and not the *facility* per se.

In *NARUC v. FERC*, that court found that allowing utility-scale storage resources to participate in wholesale markets did not usurp states' power over distribution because states retained the choice whether to let any particular resource interconnect or not, and FERC was merely removing barriers to wholesale *market access*.[52] The court was satisfied that Order 841 respected state authority by not insisting states *must* let distribution-connected storage join; states could still bar specific facilities for reliability reasons, they just couldn't impose a blanket prohibition on all storage participation. This nuance—federal rules enabling, but not compelling, participation in wholesale markets—is likely to continue to be a key point in litigation surrounding DERs.

From a broader perspective, the shift to distributed energy in the energy industry is forcing a reexamination of what the utility regulatory compact entails. Utilities historically got monopolies in exchange for an obligation to serve customers and regulated rates. If more customers partially self-supply, what obligations (and rights) persist? Some utilities have proposed "grid access charges" for solar homes to ensure they contribute to grid upkeep. Customer advocates have responded that such charges, if too high, will discourage valid investments and constitute an attempt to preserve utility profits. Commissions (and courts reviewing the regulators) may be asked to judge whether new fees are just and reasonable or whether they unlawfully penalize competitors (which, with new technologies, can be customers).

In one case, an Arizona utility's imposition of a charge falling exclusively on rooftop solar customers was challenged as unjustly discriminatory. In June 2026, the Arizona Court of Appeals vacated the commission's approval of the charge, though on procedural rather than substantive grounds: the court found that the charge was never proposed in the utility's rate application or disclosed in the public

[50] FERC Order No. 2222, *Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 172 FERC ¶ 61247, *available at* https://www.ferc.gov/sites/default/files/2020-09/E-1_0.pdf.
[51] FERC v. Elec. Power Supply Ass'n, 577 U.S. 260 (2016) (upholding FERC's rules removing barriers to demand response participation in wholesale power markets).
[52] Nat'l Ass'n of Regul. Util. Comm'rs v. FERC, 964 F.3d 1177 (D.C. Cir. 2020) (upholding FERC Order 841, on storage resource participation in wholesale power markets).

notice, depriving solar advocates and customers of due process, and that the utility never provided evidence that solar customers were responsible for the increased costs the charge purported to recover.[53] Notably, the decision leaves the door open to properly noticed and supported solar-specific charges—the ruling turned on the unfair manner of imposition rather than a categorical rejection of such fees.

Increasingly, however, rate design issues related to DERs are coming to courts in new forms other than traditional appeals of state commission decisions, even in some instances as contract or antitrust disputes.[54] Resolving these kinds of disputes will require courts to balance the benefits of innovation (customer choice, resilience, clean energy) against the traditional utility framework, which was designed to ensure reliable and equitable service.

IV. Energy Storage and Hydrogen

Energy storage has long been called the "holy grail" of the modern energy grid. If developed at scale, storage provides a means to balance intermittent generation from renewables, bolster grid resilience, and even replace fossil fuel plants that are primarily used during periods of peak demand.

Legally, storage occupies a somewhat complex jurisdictional space, because it can function as generation (injecting power to the grid), a transmission reliability resource (helping stabilize the grid reliability characteristics of more intermittent generation resources, such as solar and wind), and customer load (to the extent that power is often drawn from the grid to charge batteries). The fuzzy jurisdictional nature of storage has prompted regulators to clarify how storage is treated in wholesale markets and whether it can receive cost-of-service rates as a transmission or distribution asset. The emergence of new storage technologies (from lithium-ion to flow batteries to thermal storage) and even energy carriers like hydrogen will likely raise further questions about regulatory classification, safety standards, and infrastructure siting.

A. Scaling Up Storage in Energy Markets

A major breakthrough in the legal integration of storage came with FERC Order No. 841 (2018),[55] which required RTOs to create market rules for storage resources to provide energy, capacity, and ancillary services on a level playing field with traditional generation. Crucially, FERC also prohibited any blanket state rule that would bar storage resources located on distribution systems or behind customer meters from participating in wholesale markets.

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[53] Vote Solar v. Ariz. Corp. Comm'n, Nos. 1 CA-CC 25-0001, 1 CA-CC 25-0002, 1 CA-CC 25-0003, 1 CA-CC 25-0004 (consolidated) (Ariz. Ct. App. June 16, 2026).

[54] *See, e.g.*, Ellis v. Salt River Project, 24 F.4th 1262 (9th Cir. 2022) (finding filed rate doctrine and state action immunity does not bar antitrust challenges to Arizona solar pricing plan).

[55] *FERC Order No. 841, Elec. Storage Participation in Markets Operated by Reg'l Transmission Organizations & Indep. Sys. Operators,* 162 FERC ¶ 61127 (2018).

Some states and local utilities objected, arguing FERC was impinging on their authority over local distribution and retail sales, and challenged FERC's rule in the D.C. Circuit.

In 2020, the court upheld Order 841 in full, marking a significant affirmation of federal authority. The court agreed that FERC's rule "directly affects wholesale rates" by bringing more resources into the market, and that any impact on distribution utilities was incidental to regulating the wholesale transaction. It also noted that FERC had not actually ordered states to do anything affirmative—states retain control over interconnections and safety, and a resource still needs utility consent to connect.[56] What states cannot do is broadly prohibit a willing storage resource from participating in interstate commerce (the wholesale market), because that would frustrate FERC's statutory mandate to ensure just and reasonable rates via open competition. The D.C. Circuit's reasoning embraced a functional approach: if excluding storage resources would keep wholesale rates unjustly high or limit competition, FERC can step in, and this does not unlawfully commandeer states since the states don't have to compel any action.

This legal backdrop has paved the way for rapid growth of electricity storage in RTO markets. As more storage resources begin to participate in these markets, new operational issues are arising—such as how to ensure they actually charge and discharge as instructed (some early incidents saw batteries inadvertently exacerbating frequency deviations due to signal errors). These are handled through market rules and contracts, but if a major mishap occurs, say a blackout traced to storage misbehavior, it could spur litigation over whether the grid operator, the storage owner, or a supplier of control software is liable.

Liability in the context of grid support services has historically been limited by tariff provisions (RTOs have liability caps and immunities in their tariffs for certain things such as ordinary negligence), and participants generally indemnify the RTO and utility for issues on their end. Nonetheless, novel situations—such as a large data center with storage not taking power from the grid because at some particular time of the day, it is more economically attractive for the customer to use onsite storage even though the utility has secured generation for the data center—will likely test these contractual protections, especially as storage units proliferate at the distribution level where oversight is less direct.

Storage also raises questions when used as a regulated asset by utilities. FERC has shown an appetite for flexibility in approaching storage technology as a form of non-utility power generation, when combined with solar to meet the operational requirements of the Public Utility Regulatory Policies Act of 1978 (PURPA, covered in greater detail in Introduction to the U.S. Energy System).[57] Importantly, a battery can be a "transmission asset" if its primary function is to provide transmission reliability or defer a line upgrade. Some state commissions likewise allow utilities to include storage in their distribution investments for reliability (for instance, placing batteries at substations to handle peak load). To date, these issues are primarily playing out in regulatory dockets, but they will likely lead to legal challenges in the future to the extent they produce advantages for some customers or present discriminatory treatment in rate design.

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[56] *Nat'l Ass'n of Regul. Util. Comm'rs v. FERC*, 964 F.3d 1177.

[57] *See* Solar Energy Indus. Ass'n v. FERC, 154 F.4th 863 (D.C. Cir. 2025) (upholding FERC interpretation of PURPA's 80 megawatt (MW) ceiling that allowed a 150 MW solar array to combine with 50 MW or storage).

B. Hydrogen

Hydrogen energy transportation and storage also presents a forward-looking set of legal issues. Hydrogen can be produced via electrolysis of water (using excess renewable power or even fossil fuels), stored, and later used in fuel cells or turbines to generate electricity—essentially a way to store energy over long periods (seasonal storage) or to decarbonize certain sectors. From a regulatory standpoint, hydrogen occupies a liminal space: Is it a "fuel" like natural gas, subject to pipeline safety rules and perhaps future pipeline regulation, or is it an energy storage medium integrated with the power system?

Currently, no comprehensive federal statute akin to the NGA governs hydrogen pipelines or sales. Interstate hydrogen pipelines are few (some exist for industrial hydrogen, regulated only for safety by PHMSA under hazardous liquid pipeline rules because hydrogen is flammable). If hydrogen production and use scale up, including transport via pipeline, we might see new legislation to regulate it similarly to natural gas.

Absent that, companies building a hydrogen pipeline must rely on state law for siting and eminent domain. If a hydrogen hub pipeline crosses multiple states, each state's rules (and possibly the federal DOT pipeline safety standards) would apply, but there is a serious gap in economic regulation of hydrogen pipeline access and pricing. Absent some form of new federal legislation, legal disputes surrounding hydrogen pipelines will likely draw analogies to courts' resolutions of natural gas and oil pipeline disputes.

V. Conclusion

At bottom, the legal story of how our society "moves energy" is no longer just about moving electrons or molecules from point A to B. It is about how new technologies and societal concerns have challenged us to move legal goalposts to keep up with a rapidly transforming energy landscape. Each of the areas explored above—pipelines, the electric grid, distributed resources, and storage—illustrates the creative tension between established legal frameworks and emerging energy needs.

Judges and policymakers alike are being called upon to ensure the law, as applied, strikes the appropriate balance between meeting critical infrastructure needs while upholding fundamental principles of fairness, property rights, and state-federal balance. The coming decade will likely be as formative for energy law as any we've seen since the New Deal, as the pressures of climate change, technological advancement, electricity demand, and societal expectations converge on the fundamental task of moving energy in cleaner, smarter ways.