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SUMMARY

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State Authority to Regulate Nuclear Power: Federal Preemption Under the Atomic Energy Act (AEA)

As some state governments explore nuclear power's role in a transition away from fossil fuels, state legislatures continue to debate questions of safety and waste storage. Although safety concerns may prompt states to assert authority over nuclear power, federal law severely limits the extent to which states can regulate nuclear power. The Supreme Court has expressly held that, while states retain authority over "questions of need, reliability, cost, and other related State concerns," federal preemption prevents states from regulating radiological safety aspects of nuclear power production.

Whether a state law may regulate a part of the nuclear power lifecycle will depend principally on whether the state law or regulation in question is preempted by the Atomic Energy Act (AEA). Although there is "no one crystal clear distinctly marked formula" for determining whether a state law is preempted by federal law, the Supreme Court has established three general classes of preemption: express preemption, conflict preemption, and field preemption. In each instance, "the question of preemption is one of determining Congressional intent."

Many legal disputes surrounding federal preemption of state regulation of nuclear power have centered on field preemption. Under existing Supreme Court precedent, an analysis of whether a state law is preempted under the AEA requires a consideration of both the purpose and the effect of the state law in question. Thus, any state law that is grounded in radiological safety concerns or has a "direct and substantial" effect on the safety of nuclear plant "construction and operation" falls within the field exclusively occupied by the U.S. Nuclear Regulatory Commission (NRC) and therefore would be preempted.

This report covers general constitutional principles of preemption and analyzes the courts' interpretation of the scope of federal preemption under the AEA, including some significant opinions in the courts of appeals applying Supreme Court precedent.

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Introduction

The federal government first relinquished its monopoly on atomic energy in 1954 by permitting the private development of nuclear power production for peaceful purposes. After an initial surge in the development of commercial nuclear power, the nuclear industry suffered a long period of dormancy due, at least in part, to political barriers, an unfavorable economic climate, prohibitive construction costs, and reactor accidents accompanied by a corresponding decline in the public's perception of nuclear energy's overall safety.[1]

Increasing power demands and the desire to shift to carbon-neutral energy production methods, however, have contributed to renewed interest in nuclear power.[2] In July 2023, Georgia's Vogtle Unit 3 became the nation's second new operational reactor, and the first newly constructed reactor, since 1996.[3] Technological developments have also brought renewed interest, including new reactor designs, such as small modular reactors.[4] Recent federal legislation—including P.L. 117-169 (commonly referred to as the Inflation Reduction Act),[5] the Infrastructure Investment and Jobs Act,[6] and the CHIPS and Science Act[7]—has included substantial financial incentives for both the construction of new nuclear power production facilities and the continued operation of existing facilities.[8]

Concerns about nuclear power remain, however. Events such as the 2011 earthquake and tsunami that caused significant damage to the Fukushima Dai-ichi nuclear power plant in Japan continue to weigh on the industry.[9] Storage of nuclear waste also continues to be a point of substantial contention.[10]

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[1] Michael Mobilia, *Most U.S. Nuclear Power Plants Were Built between 1970 and 1990*, U.S. ENERGY INFORMATION ADMINISTRATION (Apr. 27, 2017), http://www.eia.gov/todayinenergy/detail.cfm?id=30972.

[2] *See, e.g.*, Andrew I. Fillat & Henry I. Miller, *Nuclear Power Is the Best Climate-Change Solution by Far*, WALL ST. J. (Nov. 4, 2021), https://www.wsj.com/articles/nuclear-power-best-climate-change-solution-by-far-global-warming-emissions-cop26-11636056581?mod=article_inline; Joshua S. Goldstein, Staffan A. Qvist, & Steven Pinker, *Nuclear Power Can Save the World*, N.Y. TIMES (Apr. 6, 2019), https://www.nytimes.com/2019/04/06/opinion/sunday/climate-change-nuclear-power.html.

[3] Elesia Fasching, Tyler Hodge, & Slade Johnson, *First New U.S. Nuclear Reactor Since 2016 Is Now in Operation*, U.S. ENERGY INFORMATION ADMINISTRATION (Aug. 1, 2023), https://www.eia.gov/todayinenergy/detail.php?id=57280; *Vogtle Electric Generating Plant, Unit 4*, U.S. NUCLEAR REGULATORY COMMISSION (NRC) (Aug. 3, 2023), https://www.nrc.gov/reactors/new-reactors/large-lwr/col-holder/vog4.html.

[4] *See, e.g.*, *Small Modular Reactors (LWR designs)*, U.S. NUCLEAR REGULATORY COMMISSION (NRC) (Sept. 19, 2022), https://www.nrc.gov/reactors/new-reactors/smr.html.

[5] 136 Stat. 1818 (2022).

[6] Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021).

[7] CHIPS (Creating Helpful Incentives to Produce Semiconductors) and Science Act, Pub. L. No. 117-167, 136 Stat. 1366 (2022).

[8] Kathryn Huff, Office of Nuclear Energy, *Inflation Reduction Act Keeps Momentum Building for Nuclear Power*, ENERGY.GOV (Sept. 8, 2022), https://www.energy.gov/ne/articles/inflation-reduction-act-keeps-momentum-building-nuclear-power.

[9] *See, e.g.*, Mitigation of Beyond-Design Basis Events, 84 Fed. Reg. 39684 (Aug. 9, 2019).

[10] *See, e.g.*, Robert L. Ferguson, *Republicans Play Politics on Yucca Mountain*, WALL ST. J.(Aug 15, 2017), https://www.wsj.com/articles/republicans-play-politics-on-yucca-mountain-1502836280?mod=article_inline; Fred Pearce, *Awash in Radioactive Waste*, N.Y. TIMES (May 24, 2018), https://www.nytimes.com/2018/05/24/opinion/nuclear-power-radioactive-waste.html?searchResultPosition=21; Madison Hilly, *Nuclear Waste is Misunderstood*, N.Y. TIMES (Apr. 28, 2023), https://www.nytimes.com/2023/04/28/opinion/climate-change-nuclear-waste.html.

In response to these competing concerns, states have taken different courses of action. Some states have recently sought to encourage construction of new nuclear reactors or continued operation of existing reactors.[11] Other states have moved to regulate parts of the nuclear power lifecycle.[12]

However, federal law severely limits the extent to which states can regulate nuclear power. The Supreme Court has expressly held that, while states retain authority over "questions of need, reliability, cost, and other related state concerns," federal preemption under the Atomic Energy Act (AEA) prevents states from regulating nuclear power for the purposes of radiological safety.[13] However, the exact scope of the AEA's preemptive effects—and therefore the extent to which states can regulate nuclear facilities—has long been litigated and remains disputed.

This report covers general constitutional principles of preemption and major court decisions interpreting the scope of federal preemption under the AEA, including the Supreme Court's most recent decision on the topic.

The Principle of Preemption[14]

The legal doctrine of preemption is grounded in the established constitutional principle that federal law takes precedence over inconsistent state law. Under Article VI, cl. 2: "[t]his Constitution, and the Laws of the United States which shall be made in Pursuance thereof; and all Treaties made, or which shall be made, under the Authority of the United States, shall be the supreme Law of the Land."[15] The Supremacy Clause, therefore, "elevates" the U.S. Constitution, federal statutes, federal regulations, and ratified treaties above the laws of the states.[16] Thus, where a state law is in conflict with a federal law, the federal law must prevail.

A state law, however, need not be utterly incompatible with federal law in order to be preempted. Where Congress has expressed an intent to displace state authority within a given subject matter by establishing exclusive federal authority, reviewing courts will deem state action in the field preempted and therefore invalid.[17] Often, the mere decision by Congress to legislate (or by an agency to regulate) comprehensively in an area is enough to supplant state authority in a

[11] State of Tenn., Exec. Order by the Governor, No. 101 (May 16, 2023), https://publications.tnsosfiles.com/pub/execorders/exec-orders-lee101.pdf; (establishing the Tennessee Nuclear Energy Advisory Council); Press Release, Glenn Youngkin, *Governor Glenn Youngkin Announces $10 Million Virginia Power Innovation Fund for All of the Above Energy and Nuclear Advancement* (Oct. 14, 2022), https://www.governor.virginia.gov/newsroom/news-releases/2022/october/name-941293-en.html; W. Va. Code Ann. § 16-27A-1, A-2 (ban on construction of nuclear power plants repealed).

[12] *See* 2023 N.M. Laws 25, https://nmonesource.com/nmos/nmsl/en/item/18775/index.do#!fragment/zoupio-_Toc143188967/BQCwhgziBcwMYgK4DsDWszIQewE4BUBTADwBdoAvbRABwEtsBaAfX2zgEYAWAZg4A5+ATgBsAdgCUAGmTZShCAEVEhXAE9oAck1SIhMLgTLVG7bv2GQAZTykAQhoBKAUQAyzgGoBBAHIBhZylSMAAjaFJ2CQkgA (prohibiting storage and disposal of radioactive waste); N.Y. Env't Conserv. Law § 30-0103 (McKinney 2023), https://www.nysenate.gov/legislation/laws/ENV/30-0103) (prohibiting "discharge of any radiological substance into the Hudson River in connection with decommissioning a nuclear power plant.").

[13] Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 205 (1983) (hereinafter *Pacific Gas*).

[14] For a discussion of preemption generally, see CRS Report R45825, *Federal Preemption: A Legal Primer*, by Bryan L. Adkins, Alexander H. Pepper, and Jay B. Sykes.

[15] U.S. CONST., Art. VI, cl. 2. *See also* Cong. Rsch. Serv., *Overview of Supremacy Clause*, CONSTITUTION ANNOTATED, https://constitution.congress.gov/browse/essay/artVI-C2-1/ALDE_00013395/ (last visited Oct. 30, 2023).

[16] N. States Power Co. v. State of Minn., 447 F.2d 1143 (8th Cir. 1971).

[17] Local government ordinances are subject to preemption under the same standards as state law. Hillsborough Cnty. v. Automated Med. Lab'ys, Inc., 471 U.S. 707 (1985).

particular field. Additionally, in evaluating whether a state law has been preempted by federal law, a court often seeks to prevent "conflicting regulation of conduct by various official bodies which might have some authority over the subject matter."[18] The doctrine of preemption, therefore, serves two purposes: (1) to enforce federal supremacy over state law and (2) to reduce the burden of compliance with multiple—and, at times, inconsistent—regulatory regimes.[19]

Although there is "no one crystal clear distinctly marked formula"[20] for determining whether a state law is preempted by federal law, the Supreme Court has established three general classes of preemption: express preemption, conflict preemption, and field preemption.[21] In each class, however, "the question of preemption is one of determining Congressional intent."[22]

Express preemption exists where the language of a federal statute explicitly states the degree to which related state laws are superseded by the federal statute.[23] In including such language, Congress has expressed its clear intent that the federal statute preempts state attempts to legislate on the subject matter. For example, the Employment Retirement Income Security Act of 1974 contained an unusually broad express preemption provision, stating that the act "supersede[d] any and all State laws insofar as they may now or hereafter relate to any employee benefit plan" described in the act.[24]

Even if Congress has not articulated its view as to a statute's intended impact on state laws, a court may find *implied* preemption if there is evidence that Congress intended to supplant state authority.[25] Courts generally find implied preemption in two situations. First, in a situation known as conflict preemption, federal law preempts a state law "where 'compliance with both federal law and state regulations is a physical impossibility' ... or where state law stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress."[26] Thus, where one cannot simultaneously comply with both state and federal law, or where the state law directly frustrates the purpose of a federal law, federal law preempts the state law. Second, in a situation known as field preemption, federal law preempts a state law where a "scheme of federal regulation is so pervasive as to make reasonable the inference that Congress left no room for the States to supplement it."[27] Where Congress has established a substantial regulatory framework, any state law falling within the occupied field—even if consistent with federal law—may be preempted. Congress can sufficiently occupy the field so as to displace state law either through statute or pursuant to a delegation to an agency to regulate extensively in the field. Much of the debate surrounding federal preemption of state regulation of nuclear power has centered on field preemption.

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[18] Amalgamated Ass'n of St., Elec. Ry. & Motor Coach Emp. of Am. v. Lockridge, 403 U.S. 274, 285-86 (1971).

[19] Additionally, the Supremacy Clause ensures federal control over policy areas in which "the United States must act as a single nation, led by the federal government, rather than as a loose confederation of independent sovereign states." Skull Valley Band of Goshute Indians v. Nielson, 376 F.3d 1223, 1239 (10th Cir. 2004) (quoting Abraham v. Hodges, 255 F.Supp. 2d 539, 549 (D.S.C. 2002).

[20] Hines v. Davidowitz, 312 U.S. 52, 67 (1941).

[21] *See, e.g.*, English v. Gen. Elec. Co., 496 U.S. 72, 79 (1990) ("By referring to these three categories, we should not be taken to mean that they are rigidly distinct.").

[22] *Nielson*, 376 F.3d at 1240 (citing Wardair Canada, Inc. v. Fla. Dep't of Revenue 477 U.S. 1 (1986)).

[23] *See, e.g.*, CSX Transp., Inc. v. Easterwood, 507 U.S. 658, 664 (1993).

[24] 29 U.S.C. § 1144.

[25] However, where Congress legislates in an area displacing "the historic police powers of the States," courts should find implied preemption only where it is the "clear and manifest purpose of Congress." Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947).

[26] Gade v. Nat'l Solid Wastes Mgmt. Ass'n, 505 U.S. 88, 98 (1992) (internal citations omitted).

[27] *Rice*, 331 U.S. at 230.

Of the various forms of preemption, field preemption can be the most difficult to apply. Although the notion that Congress has exclusively "occupied" a field may be simple in theory, identifying the boundaries of the field that has been occupied by federal law—and whether a given state statute or regulation falls into that field—can be complex in application.[28] In considering whether Congress intended to exclusively occupy a given field, courts will typically consider additional factors, such as whether Congress is regulating in an area of traditional federal responsibility, whether Congress intended to eliminate dual federal and state regulations, whether allowing state regulation in the area would interfere with the goals of the federal regulatory scheme, and whether the state can assert an important and traditional state interest.[29]

Preemption Under the Atomic Energy Act

Prior to 1954, the federal government maintained a complete monopoly on the use, control, and ownership of nuclear technology.[30] However, the Atomic Energy Act of 1954 (AEA) marked a clear shift away from public ownership toward the private development of nuclear energy for peaceful purposes.[31] In effectuating this transfer, the AEA encouraged private development of nuclear power pursuant to a strict federal licensing and regulatory regime. Accordingly, while private entities were granted the authority to own, construct, and operate commercial nuclear power reactors, they would do so under the extensive supervision of the Atomic Energy Commission (AEC). With a focus on ensuring national security and maintaining public health and safety, the AEA provided the AEC with exclusive jurisdiction over the license, transfer, delivery, receipt, acquisition, possession, and use of all nuclear materials. Although states retained their traditional and established role over the "generation, sale, or transmission of electric power,"[32] given the AEC's exclusive and comprehensive regulatory authority over nuclear materials, "no significant role was contemplated for the States."[33]

In 1959, however, Congress amended the AEA to provide the states with greater authority in regulating nuclear materials and nuclear power.[34] The amendments, which contained three key preemption-related provisions, were passed for the express purpose of "clarify[ing] the respective responsibilities ... of the States and the [Federal Government] with respect to ... nuclear materials."[35] First, the amendments authorized the AEC to enter into agreements with states for the "discontinuance" of AEC authority over byproduct materials, source materials, and special nuclear materials in quantities not sufficient to create a nuclear chain reaction.[36] The provision

[28] For a survey of the many varying outcomes federal courts have reached in preemption cases under the Atomic Energy Act see, James L. Buchwalter, *Preemption Issues Under Atomic Energy Act of 1954, §§ 1 et seq., 42 U.S.C.A. §§ 2011 et seq.*, 198 A.L.R. FED. 147 (2004 & Supp. 2023).

[29] Erwin Chemerinsky, CONSTITUTIONAL LAW: PRINCIPLES AND POLICIES 466–67 (7th ed. 2023).

[30] The federal monopoly was motivated principally by a concern over the potential military uses of nuclear materials. For a discussion of the debates surrounding the passage of the first Atomic Energy Act, see Byron S. Miller, *A Law Is Passed—The Atomic Energy Act of 1946*, 15 U. CHI. L. REV. 799 (1948).

[31] An Act to Amend the Atomic Energy Act of 1946, as Amended, and for Other Purposes, Pub. L. 83-703, 68 Stat. 919 (1954) (Codified at 42 U.S.C. §§ 2011, et seq.).

[32] AEA, Pub. L. 83-703, § 271, 68 Stat. 919, 960 (1954).

[33] English v. Gen. Elec. Co., 496 U.S. 72, 81 (1990).

[34] An Act to amend the Atomic Energy Act of 1954, as amended, with respect to cooperation with States, P.L. 86-373, 78 Stat. 688 (1959) (Codified at 42 U.S.C. § 2021).

[35] 42 U.S.C. § 2021(a).

[36] *Id.* § 2021(b). The provision did not permit, for instance, states to enter into an agreement with the AEC to regulate spent nuclear fuel produced by nuclear power plants. STAFF OF H. COMM. INTERIOR AND INSULAR AFFAIRS, (continued...)

provided the states with an explicit avenue for asserting increased regulatory authority but only in limited circumstances and only with the consent of the AEC. Second, the amendments made clear that, notwithstanding the limited jurisdiction available to states through approved agreements, the AEC "shall retain authority and responsibility" over the "construction and operation" of nuclear power plants as well as the "disposal of such other byproduct, source, or special nuclear material" as the AEC may choose to regulate due to their hazardous potential.[37] Finally, the amendments attempted to reaffirm states' traditional role in the regulation of power generation while simultaneously asserting the AEC's exclusive authority over radiological safety, providing that "[n]othing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes *other than protection against radiation hazards*."[38]

Pursuant to the authority delegated under the AEA, the AEC—along with its successor agency, the Nuclear Regulatory Commission (NRC)[39]—has promulgated detailed and comprehensive regulations with respect to the operation of nuclear facilities and the storage of nuclear waste.[40]

The Supreme Court's Interpretation of the Preemptive Scope of the AEA

The intent of the 1959 amendments was to clearly delineate the roles of state and federal government in the regulation of nuclear power.[41] In practice, the amendments rendered the division between state and federal authority unclear, leaving the courts to grapple with the preemptive effect of the 1959 amendments over the subsequent decades.

The Supreme Court first directly addressed the AEA's preemptive scope in 1983.[42] In *Pacific Gas & Electric v. State Energy Resources Conservation and Development Commission*, the Court upheld a California law that prohibited the construction of any new nuclear power plant until the California Energy Commission "finds that there has been developed and that the United States through its authorized agency has approved and there exists a demonstrated technology or means

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102D CONG., STATE REGULATION OF NUCLEAR POWER: AN OVERVIEW OF CURRENT STATE REGULATORY ACTIVITIES (Comm. Print 13) (SUPPLEMENTAL READING OF DAN M. BERKOVITZ, COUNSEL COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, U.S. SENATE, MODERNIZING THE ATOMIC ENERGY ACT: UPDATING THE ROLE OF THE STATES IN REGULATING THE CONSTRUCTION AND OPERATION OF NUCLEAR POWER PLANTS AND THE DISPOSAL OF NUCLEAR WASTES 44 (1992), https://congressional.proquest.com/congressional/result/pqpresultpage.gispdfhitspanel.pdflink/$2fapp-bin$2fgis-congresearch$2fb$2fa$2f0$2f5$2fcrs-1992-enr-0086_from_1_to_314.pdf/entitlementkeys=1234%7Capp-gis%7Ccongresearch%7Ccrs-1992-enr-0086). ("The activities which the state would be allowed to regulate would be those that did not involve either the use or production of nuclear materials in nuclear reactors or the disposal of nuclear wastes that the [NRC] determined were required to be exclusively regulated by the [NRC].).

[37] 42 U.S.C. § 2021(c).

[38] *Id.* § 2021(k) (emphasis added).

[39] The AEC was abolished in 1974, and all of its licensing and regulatory authority was transferred to the newly created Nuclear Regulatory Commission (NRC). Energy Reorganization Act of 1974, P.L. 93-438 § 104, 88 Stat. 1233, 1237 (1974).

[40] *See* 10 C.F.R. parts 52, 54, 55, and 70.

[41] Atomic Energy Commission State Cooperation Act, P.L. 86-373, 78 Stat. 688 (1959) (Codified at 42 U.S.C. § 2021).

[42] In 1971, the Supreme Court affirmed, in a *per curiam* order without a written opinion, the U.S. Court of Appeals for the Eighth Circuit (Eighth Circuit) decision in *Northern States Power Co. v. Minnesota*, 447 F.2d 1143 (8th Cir. 1971). *Northern States* involved a challenge to a Minnesota state agency's attempt to regulate the level of radioactive discharges from a nuclear power plant. The Eighth Circuit held that Congress intended to preempt state regulation pertaining to the construction and operation of nuclear reactors because of the "pervasiveness of the federal regulatory scheme which Congress directed and which the AEC has carried into effect." *Id.* at 1152–53.

for the disposal of high-level nuclear waste."[43] The law, which remains in force, has amounted to an effective moratorium on the construction of any new nuclear power plant in the state. Significant to the holding, California argued that the law was necessary to avoid the economic consequences of a critical nuclear waste buildup, which could result in "unpredictably high costs to contain the problem or, worse, shutdowns in reactors."[44] The law was not, the state argued, motivated by radiological safety concerns.[45]

In upholding the California law, the Court considered and accepted the state's economic purpose and held that the law was outside the preemptive scope of the AEA.[46] In discussing the division of authority between federal and state government under the AEA, the Court asserted that Congress had intended for the continued "dual regulation of nuclear-powered electricity generation."[47] Pursuant to this regime, state and federal government would exercise concurrent, yet distinct, regulatory authority over the nuclear power industry. In enacting the AEA, Congress intended "that the federal government should regulate the radiological safety aspects involved in the construction and operation of a nuclear plant, but that the states retain their traditional responsibility in the field of regulating electrical utilities for determining questions of need, reliability, cost, and other related state concerns."[48] For example, the Court held, states retain the authority to make the initial determination regarding the need for nuclear power.

The Court then employed Congress's intended division of authority to determine the preemptive scope of the AEA. In doing so the Court established two instances in which state law was preempted. First, the Court recognized that any state statute that sought to regulate the "construction and operation" of a nuclear power plant, even if enacted out of non-safety concerns, would "directly conflict with the NRC's exclusive authority over plant construction and operation."[49] Thus, any state law seeking to regulate the "construction or operation" of a nuclear power plant would be preempted either as in "conflict" with federal law or as within a field exclusively occupied by the NRC. Without elaborating, the Court concluded that the California statute did not attempt to regulate the "construction or operation" of a nuclear reactor.[50]

Second, the Court established that state regulations motivated by radiological safety concerns are broadly preempted by the AEA. According to the Court, the federal government "has occupied [the] entire field of nuclear safety concerns," except for those "limited powers expressly ceded to states" through 42 U.S.C. §2021.[51] Thus, under field preemption, state attempts to regulate nuclear power that are grounded in safety concerns are invalid, as Congress delegated comprehensive authority over nuclear safety to the NRC. However, the Court determined that a state law with an established non-safety rationale may not be preempted.[52] Because the California statute was based on the potential economic consequences of a buildup of nuclear waste—rather

[43] 461 U.S. 198 (1983). CAL. PUB. RES. CODE§ 25524.2, https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=25524.2. The federal government has yet to develop a permanent means for disposing of nuclear waste.

[44] *Pacific Gas*, 461 U.S. at 214.

[45] *Id.*

[46] *Id*. at 216.

[47] *Id*. at 212.

[48] *Id*. at 205. Under the AEA, "the federal government maintains complete control of the safety and 'nuclear' aspects of energy generation; [and] the States exercise their traditional authority over the need for additional generating capacity, the type of generating facilities to be licensed, land use, ratemaking, and the like." *Id.* at 212.

[49] *Id*. at 212.

[50] *Id.*

[51] *Id*. at 212.

[52] Id. at 212-13.

than safety issues associated with that buildup—the law did not fall within the prohibited field. Although the petitioners pointed to other "indicia" suggesting that the California legislature was actually motivated by safety concerns rather than the proffered economic concerns, the Court considered and rejected each of those arguments in turn.[53] The Court then rejected further investigation into the state's intent and accepted California's "avowed economic purpose as the rationale for enacting" the restrictive provision.[54] The Court did not want to "become embroiled in attempting to ascertain California's true motive," as any "inquiry into legislative motive is often an unsatisfactory venture."[55]

Third, the Court held that the California statute did not conflict with NRC's regulation of nuclear waste disposal.[56] Although the NRC had concluded that "progress toward the development of disposal facilities" was sufficient to allow for the continued licensing of nuclear reactors,[57] the Court made clear that the NRC's determination "indicates only that it is safe to proceed with such plants, not that it is economically wise to do so."[58] Accordingly, a state is free to prevent the construction of new nuclear power plants until the state is satisfied that the ultimate disposal of nuclear waste does not pose an economic obstacle to the reactor's ability to provide power to the state.[59] Importantly, the California law also did not "impose its own standards on nuclear waste disposal," as the regulation of nuclear waste disposal was a field "occupied by the federal government."[60] Rather, the Court interpreted the statute as acknowledging exclusive federal responsibility in regulating how nuclear waste is stored.[61]

Finally, the Court rejected the petitioners' argument that the California statute should be preempted as "an obstacle to the accomplishment and execution of the full purposes and objectives of Congress."[62] Although the Court determined that the "primary purpose" of the AEA was to promote the development of nuclear power for peaceful purposes, that goal was not to be accomplished "at all costs."[63] While the California law may have undercut the continued development of nuclear power, the Court noted that "the legal reality remains that Congress has left sufficient authority in the States to allow the development of nuclear power to be slowed or even stopped for economic reasons."[64] The Court determined that the objective of the AEA was to encourage, but not mandate, the development of nuclear power.[65]

Although recent precedent calls into question certain elements of the analysis in *Pacific Gas*, it remains the authoritative case in assessing the preemptive scope of the AEA.[66] The legacy of the case can be reduced to a number of key principles. First, the AEA established a division of

[53] *Id*. at 216.

[54] *Id*.

[55] *Id*. (citing U.S. v. O'Brien, 391 U.S. 367 (1968)).

[56] *Id.*

[57] *Id*. at 218. For more on the litigation associated with NRC's determination of the risks to public health and safety posed by the disposal of nuclear waste see, Nat. Res. Def. Council, Inc. v. U.S. Nuclear Regul. Comm'n, 582 F.2d 169 (2d Cir. 1978).

[58] *Pacific Gas* at 218.

[59] *Id.*

[60] *Id.*

[61] *Id.*

[62] *Id.* at 204.

[63] *Id.* at 221.

[64] *Id*. at 223.

[65] *Id.*

[66] *Id.*

authority between federal and state government such that states retain substantial authority over the threshold decision of the need for nuclear power. Second, the AEA's goal of encouraging the development of nuclear power does not supersede a state's economic decision to restrict that development. Finally, a state or local statute or regulation that seeks to regulate the processes for the construction and operation of a nuclear power plant—or is otherwise motivated by radiological safety concerns—falls within the preempted field exclusively occupied by the NRC.

In its next term, the Supreme Court narrowed the field occupied by the federal government under the AEA, albeit in a limited way. In *Silkwood v. Kerr-McGee Corp.*, the Court held that a state's award of punitive damages as a consequence of a radiological leak from a nuclear facility was not preempted by the AEA.[67] The Court determined that Congress, in enacting both the AEA and the Price-Anderson Act—which provided a scheme for liability in the case of a nuclear disaster—did not intend to prohibit the states from awarding otherwise available remedies to individuals injured by radiological elements.[68] The Court, therefore, concluded that state-awarded damages for radiation injuries do not fall within the radiological safety field occupied by the federal government as defined in *Pacific Gas*, nor did the Court find that a state award for damages for radiation injuries created an "irreconcilable conflict between the federal and state standards" or frustrated the "objectives" of federal law.[69]

In a subsequent consideration of the scope of preemption under the AEA, the Supreme Court held that the AEA did not preempt a state-law claim by an employee of a nuclear power plant for intentional infliction of emotional distress.[70] In *English v. General Electric Co.*, the employee had claimed that the defendant nuclear power company had engaged in "extreme and outrageous conduct" after she had made repeated nuclear safety complaints.[71] The actual holding in *English* was similar to *Silkwood*, but its interpretation of *Pacific Gas* was significant. While *Pacific Gas* held that a state law that was *motivated* by "safety concerns" was sufficient to trigger field preemption, *English* extended that analysis to recognize that a state law may also be preempted based on its *effect*. According to the Supreme Court, any state law that is motivated by radiological safety concerns *or* has a "direct and substantial" effect on the safety of nuclear plant "construction and operation" falls within the field exclusively occupied by the NRC and is preempted. The Court determined that the tort law in question in *English* was not motivated by safety concerns, nor was the effect of the law on radiological safety concerns "direct nor substantial enough to place petitioner's claim in the pre-empted field."[72]

Three significant U.S. Courts of Appeals opinions postdating *English* set the stage for the Supreme Court's most recent decision on preemption under the AEA. First, in *Skull Valley Band of Goshute Indians v. Nielson*, the U.S. Court of Appeals for the Tenth Circuit (Tenth Circuit) held that a series of Utah statutes regulating the storage and transportation of spent nuclear fuel were preempted by the AEA.[73] Principally, the Utah statutes established state licensing requirements for the storage of nuclear waste and required counties to address nuclear waste storage and transportation concerns in their land use planning provisions. The Tenth Circuit struck down the statutes as "grounded in safety concerns" and therefore preempted under *Pacific Gas*.[74] The

[67] 464 U.S. 238 (1984).

[68] *Id*. at 251–258.

[69] *Id*. at 256.

[70] English v. Gen. Elec. Co., 496 U.S. 72 (1990).

[71] *Id*. at 71–78.

[72] *Id*. at 82.

[73] 376 F.3d 1223 (10th Cir. 2004).

[74] *Id*. at 1254.

statute itself expressed the state's concerns over the "effects of nuclear waste on the health and welfare of Utah citizens," and Utah had failed to offer evidence that it had a different, "non-safety rationale" for the statute.[75] This point suggests that in the Tenth Circuit, the burden is on the state to present evidence of its non-safety rationale rather than on the opposing party to prove that the statute was motivated by safety concerns.

Similarly, in the 2008 decision of *U.S. v. Manning*, the U.S. Court of Appeals for the Ninth Circuit (Ninth Circuit) struck down the Washington State Cleanup Priority Act (CPA) that required the mitigation of "mixed waste" contamination before additional waste could be stored within the state.[76] The State of Washington is home to the Department of Energy's Hanford Nuclear Reservation, which houses more than 53 million gallons of mixed radioactive and nonradioactive waste—at least 1 million gallons of which has leaked into the surrounding groundwater.[77] In considering the state law, the Ninth Circuit held that the CPA would be subject to field preemption if "(1) the purpose of the CPA is to regulate against radiation hazards, or (2) if the CPA directly affects decisions concerning radiological safety."[78] The court determined that the CPA was preempted on both grounds, as the purpose of the law was to "regulate the treatment, storage, and disposal of radioactive materials, among other materials, in order to protect the health and safety of Washington residents and the environment."[79] In reaching that determination, the court gave great weight to language of the CPA—including the general "policy" section of the statute and the structure of the law—which included state permit conditions on the disposal of nuclear waste. The court also found that the CPA would "directly and substantially impact[] the DOE's decisions on the nationwide management of nuclear waste."[80]

Finally, in 2013, the U.S. Court of Appeals for the Second Circuit (Second Circuit) held in *Entergy Nuclear Vermont Yankee v. Shumlin* that the AEA preempted two Vermont statutes that purported to control the continuing operation of an existing nuclear plant rather than the construction of a new plant.[81] The case involved the Vermont Yankee nuclear plant, the only nuclear plant in Vermont.[82] In 1972, the NRC granted a 40-year facility operating license for the Vermont Yankee plant, which was set to expire on March 21, 2012.[83] The NRC granted a twenty-year renewal of that license on March 21, 2011.[84] The Vermont legislature, however, passed two

[75] *Id*. at 1246.

[76] 527 F.3d 828 (9th Cir. 2008). Washington State Cleanup Priority Act (CPA), WASH. REV. CODE Chapter 70.105E (2020), https://app.leg.wa.gov/rcw/dispo.aspx?cite=70.105E (Repealed by Laws 2020, WASH. SESS. Laws 530, eff. June 11, 2020, https://lawfilesext.leg.wa.gov/biennium/2019-20/Pdf/Bills/Session%20Laws/House/2246-S.sl.pdf

[77] *Manning*, 527 F.3d at 831. Much of the high-level waste stored at the Hanford facility is from the original Manhattan Project.

[78] *Id.* at 836.

[79] *Id.* at 838.

[80] *Id*. at 839.

[81] 733 F.3d 393 (2d Cir. 2013) (hereinafter *Vermont Yankee*).

[82] Entergy announced plans to decommission the Vermont Yankee plant shortly after the Second Circuit's decision, citing low natural gas prices and a resulting depression of wholesale electricity prices. Matthew L. Wald, *Vermont Yankee Plant to Close Next Year as the Nuclear Industry Retrenches*, N.Y. TIMES (Aug. 27, 2013), https://www.nytimes.com/2013/08/28/science/entergy-announces-closing-of-vermont-nuclear-plant.html. Vermont Yankee's reactor permanently shut down in December 2014, and the current owners of the plant plan to complete decommissioning by 2030. Vermont Yankee Nuclear Power Station, U.S. NUCLEAR REGULATORY COMMISSION (NRC) (Mar. 9, 2021), https://www.nrc.gov/info-finder/decommissioning/power-reactor/vermont-yankee.html.

[83] *Vermont Yankee*, 733 F.3d at 398.

[84] *Id.* at 406.

statutes,[85] the practical effect of which was to require affirmative permission from the legislature for the Vermont Yankee plant to continue operating past March 21, 2012.[86] Before the Second Circuit, Vermont pointed to provisions in these statues that required the legislature to consider a number of factors, arguing that the legislative purpose of these laws was to advance policy interests in "increased use of a diverse array of renewable power sources" and "promotion of energy sources that are more cost-effective."[87] The Second Circuit agreed that these "asserted policy interests would not necessarily interfere with the preempted concern of radiological safety" but found these professed policy interests unpersuasive in light of the existing choices available to Vermont utilities and the economic realities of the energy markets.[88] After closely examining the legislative history of these two statutes, the Second Circuit held that the legislature's primary purpose in enacting the statutes was, in fact, radiological safety.[89] The Second Circuit noted "the remarkable consistency with which both state legislators and regulators expressed concern about radiological safety and expressed a desire to evade federal preemption"[90] and stated that the legislative history showed an attempt "to obfuscate the record through the use of misleading statements that they thought would pass muster under *Pacific Gas*."[91] After this thorough review of legislative history, the Second Circuit held that the AEA preempted both statutes.[92]

Virginia Uranium: Divergent Views on Legislative Purpose

Six years after the Second Circuit's decision in *Vermont Yankee*, the Supreme Court handed down its most recent decision on preemption of state law under the AEA, *Virginia Uranium, Inc. v. Warren*.[93] The case concerned the largest known uranium deposit in the United States, discovered near Coles Hill, VA, in the 1970s.[94] Shortly after that discovery, Virginia adopted a complete ban on uranium mining within the Commonwealth.[95]

When the market price of uranium increased, the owners of the land above the Coles Hill deposit and the holders of the rights to mine that deposit developed plans to exploit the Coles Hill deposit.[96] These mining interests would first mine the uranium ore, then "mill" the ore into a

[85] VT. STAT. ANN. tit. 10, § 6522 (2023), https://legislature.vermont.gov/statutes/section/10/157/06522; VT. STAT. ANN. tit. 30, §§ 248, 254 (2023), https://legislature.vermont.gov/statutes/chapter/30/005.

[86] *Vermont Yankee*, 733 F.3d at 405.

[87] *Id.* at 416, 424.

[88] *Id.* at 416–418. The Second Circuit found that Vermont's professed goal of diversifying electricity production by closing the Vermont Yankee plant rested on the false premise that retail utilities in Vermont did not have the ability to purchase power from alternative sources. The Second Circuit noted that the plant produced only one-third of the state's power. Moreover, the state had effective alternatives for diversification, including directing retail utilities to build renewable generation facilities, to purchase power from "environmentally-friendly" producers, or to purchase power from out-of-state sources. Similarly, the Second Circuit found that the professed goal of promoting lower-cost sources of power did not make sense, because Vermont Yankee sold its power on an open wholesale market, which allowed retail utilities to purchase from the most cost-effective providers. The Second Circuit also rejected the state's professed concern with "potential liability for future decommissioning costs," because the NRC required operators of nuclear facilities to file decommissioning plans, pre-fund those plans, and periodically report on the status of those funds.

[89] *Id.* at 420, 426.

[90] *Id.* at 420, 424.

[91] *Id.* at 421.

[92] *Id.* at 433.

[93] 139 S. Ct. 1894 (2019) (hereinafter *Virginia Uranium*).

[94] *Id.* at 1910 (Ginsburg, J., concurring).

[95] *Id.* at 1910–1911 (Ginsburg, J., concurring).

[96] Virginia Uranium, Inc. v. McAuliffe, 147 F. Supp. 3d 462 (W.D. Va. 2015), aff'd sub nom. Virginia Uranium, Inc. v. Warren, 848 F.3d 590 (4th Cir. 2017), aff'd, 139 S. Ct. 1894 (2019).

usable form called "yellowcake," which they could then sell to nuclear power plants.[97] Both the milling process and the storage of resulting waste materials, called tailings, are typically done at the mine site.[98]

The mining interests brought suit to overturn the Virginia mining law. All parties agreed that the AEA regulates uranium milling and tailings but not uranium mining.[99] Nevertheless, the mining interests argued that the AEA preempted the Commonwealth's mining ban under two theories. First, they put forward a field preemption argument, alleging that the Commonwealth enacted the mining ban "only because of concerns about the radiological safety of the subsequent *milling* of uranium ore and the management of its *tailings*"—a field completely occupied by the AEA—and that mining safety was mere pretext.[100] They further argued that, regardless of the Commonwealth's professed motivations, *Pacific Gas* required the Court to determine for itself whether the mining law in fact arose from radiological safety concerns.[101] Second, the mining interests argued conflict preemption on the ground that the mining ban "upset the careful balance" between promotion of nuclear power and radiological safety that Congress sought to maintain through the AEA, thereby creating an obstacle to achieving the AEA's purpose.[102]

A splintered Supreme Court decided that the AEA did not preempt Virginia's mining ban. The Court produced no majority opinion: Three justices joined in the lead opinion, three justices joined in an opinion concurring in the judgment, and three justices filed a dissenting opinion. These opinions disagreed primarily over the meaning, application, and continuing relevance of *Pacific Gas*'s treatment of legislative intent. Justice Gorsuch's lead opinion rejected the field preemption argument on the simple ground that mining is not a regulated activity under the AEA.[103] Distinguishing *Pacific Gas* because the law at issue there either concerned or came "close to trenching on" a regulated activity, Justice Gorsuch determined that precedent did not require any inquiry into the motives behind the Commonwealth's ban.[104] He commented that *Pacific Gas* "may have made more of state legislative purposes than the terms of the AEA allow" and cited "well-known conceptual and practical" concerns that argue against inquiring into a legislature's intent.[105] Justice Gorsuch rejected the conflict preemption argument with similar textualist reasoning, stating that "[t]he only thing a court can be sure of is what can be found in the law itself" and finding that the purported purpose frustrated by the Virginia ban was not evident in the statutory text.[106]

Justice Ginsburg, in her concurring opinion, agreed with much of Justice Gorsuch's analysis but pointedly refused to join Justice Gorsuch's "discussion of the perils of inquiring into legislative motive."[107] Although Justice Ginsburg agreed with the lead opinion that the precedent of *Pacific Gas* required no inquiry into legislative purpose in this case because the mining ban "targets an

[97] *Virginia Uranium* at 1900.

[98] *Id.*

[99] *Id.* at 1916 (Roberts, C.J., dissenting) ("The parties agree that the field of uranium mining safety is not preempted . . . And it is undisputed that radiological safety concerns about *milling* and *tailings* are preempted fields." (emphasis in original)).

[100] *Virginia Uranium*, Br. for Plaintiffs-Appellants at 22–23 (emphasis in original).

[101] *Id.*

[102] *Id.*

[103] *Virginia Uranium* at 1903-1909.

[104] *Id.* at 1904.

[105] *Id.* at 1904–1907.

[106] *Id.* at 1907–1909.

[107] *Id.* at 1909.

exclusively state-regulated activity," her opinion explicitly acknowledged that such an inquiry may be appropriate in other circumstances.[108]

In his dissenting opinion, Chief Justice Roberts relied on *Pacific Gas* to argue that the Court should inquire into legislative purpose when a state law, such as the Virginia mining ban, purports to regulate a non-preempted field but has "the purpose and effect regulating preempted fields."[109]

Because no opinion in *Virginia Uranium* received the support of a majority of the Court, the case produced no binding precedent. *Pacific Gas* therefore remains the controlling precedent on the question of when and how a court should inquire into the intent of a legislature when considering a law that has the effect of regulating nuclear safety. If a future Court follows the reasoning of the lead opinion, a state law that is nominally or even pretextually directed at an activity outside the ambit of the AEA will not be preempted regardless of its effect on regulated activities. That approach to preemption would leave open an avenue for state legislatures to enact laws impacting activities that would otherwise be beyond their reach so long as they frame those laws as explicitly regulating activities not covered by the AEA.

Congressional Authority

Courts have recognized the NRC's exclusive authority over radiological safety aspects of the construction and operation of nuclear power plants, but they have struggled to define the precise borders of the preemption that is established by that authority. Given the uncertainties associated with field preemption generally, it is not surprising that the AEA has been subject to a number of disparate interpretations, which have given rise to inconclusive case law. It is clear, however, that states retain authority over certain decisions related to nuclear power, such as "the need for additional generating capacity, the type of generating facilities to be licensed, land use, rate making, and the like."[110] Accordingly, states that have sought to assert authority over nuclear power production have done so by avoiding laws related to radiological safety and how nuclear plants are operated and constructed—focusing instead on the initial determination of whether a need for nuclear power exists and whether nuclear power is economically feasible. These long-standing state statutes are wide ranging. For example, Minnesota has enacted an outright prohibition on new nuclear power plants, and New York has banned new nuclear power plants in particular counties.[111] Some states, such as California, have enacted laws that condition the construction of new nuclear power plants upon certain findings of a state regulatory body.[112] The required finding is often associated with the existence of a viable means for the disposal of nuclear waste.[113] Others require ratification—either by the state legislature, through statewide referendum, or both—before establishing a new nuclear power plant.[114]

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[108] *Id.* at 1913–1914.

[109] *Virginia Uranium* at 1916.

[110] *Pacific Gas*, 461 U.S. at 212.

[111] Minn. Stat. §216B.243 Subd. 3b.; N.Y. Pub. Auth. Law §1020-t.

[112] *See, e.g.*, Conn. Gen. Stat. §22a-136; 220 Ill. Comp. Stat. 5/8-406; N.J. Stat. Ann. §13:19-11.

[113] *See, e.g.*, Conn. Gen. Stat. §22a-136 ("No construction shall commence on a fifth nuclear power facility until the Commissioner of Energy and Environmental Protection finds that the United States Government, through its authorized agency, has identified and approved a demonstrable technology or means for the disposal of high level nuclear waste.").

[114] *See, e.g.*, Haw. Const. Art. 11, §8 ("No nuclear fission power plant shall be constructed or radioactive material disposed of in the State without the prior approval by a two-thirds vote in each house of the legislature."); Me. Rev. Stat. §4302 ("Prior to the construction of any nuclear power plant within the State, the question of approving that construction must be submitted to the voters of the State.... ").

Congress, however, retains the authority to define the preemptive scope of the AEA through the exercise of its legislative power. If Congress disagrees with a court's interpretation of the AEA or a state's regulatory activity in an area subject to congressional authority, it is free to amend the statute to restrict, enlarge, or clarify the statute's preemptive effects. It is ultimately "up to Congress to determine whether a state has misused the authority left in its hands."[115] The Supreme Court has expressly invited Congress to adjust the separation of authority between the states and the federal government if Congress believes it is appropriate: In *Pacific Gas*, the Court conveyed that "it is for Congress to rethink the division of regulatory authority in light of its possible exercise by the States to undercut a federal objective. The courts should not assume the role which our system assigns to Congress."[116] If Congress believes that courts have interpreted the AEA in a way that provides states with too much freedom in slowing or preventing the development of nuclear power—or, conversely, that courts have interpreted the AEA in a way that excessively restricts a state's ability to regulate nuclear power within its borders—or if Congress simply seeks to mitigate the uncertainty associated with defining the scope of field preemption under the AEA, then Congress is free to expressly adjust the preemptive field of the AEA accordingly.

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Legislative Attorney Todd Garvey was the author of a prior version of this report. Inquiries on this topic can be submitted to the listed author.

Disclaimer

[115] *Pacific Gas*, 461 U.S. at 216.

[116] *Id*. at 223.