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ARTICLES

NOTES

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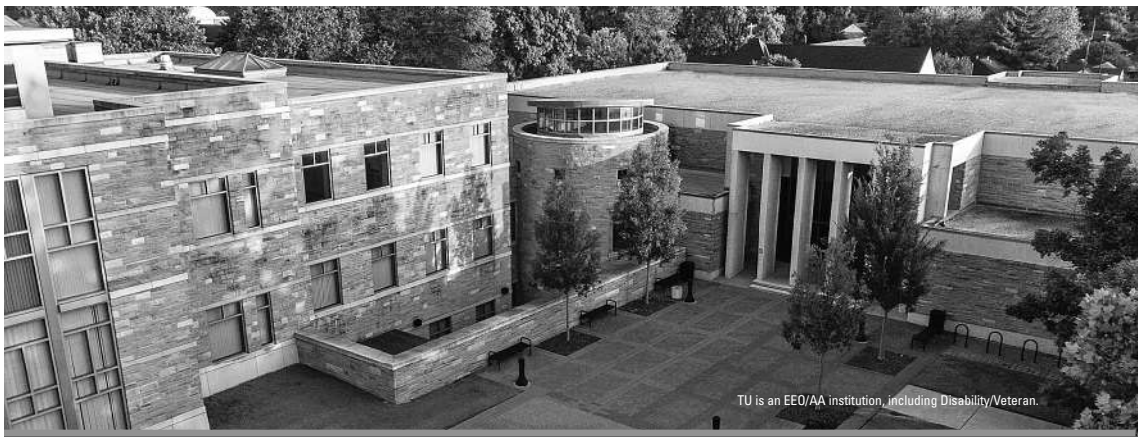

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COMMITTEE REPORTS

Neither the reports of the Energy Bar Association Committees nor the annual review of the Canadian energy law developments are included in the print version of the Journal. Rather they are published online on the EBA's website at www.felj.org. Persons citing to the reports should use the following format: [Title of Report], 44 Energy L.J. [page number] Online (2023), [link to report]. Included in the full electronic version of the Energy Law Journal, Volume 44, No. 1, are the following reports:

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This Award was created in memory of Paul Nordstrom, a past President of the Energy Bar Association (EBA) and motivating force in the organization of the Charitable Foundation of the EBA (CFEBA). The first award was given to Paul posthumously. It is an award to honor and to recognize exemplary long-term service or a particularly significant example of public service by a current or past member to the community through the EBA, the CFEBA, or the Foundation of the Energy Law Journal. Exemplary community service outside of these organizations may also be considered as a criterion for the Award.

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This Award was created in memory of Jason F. Leif, a past President of the Energy Bar Association (EBA), a past President of the Houston Chapter of the EBA, and a motivating force in the revitalization of the Houston Chapter. This award honors and recognizes exemplary long-term service, or one or more particularly significant examples of service, by an EBA member to one or more of the EBA Chapters, enhancing the role of the EBA Chapters in representing EBA's values and character at the regional level. Exemplary service to the community in connection with EBA Chapter activities may also be considered. The EBA Board created this award in 2018, and voted unanimously to honor Jason as the first recipient of the Award.

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2022	Jason Marshall
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And we gratefully acknowledge those EBA members and others who have so generously contributed in the past.

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DIVERSITY AND INCLUSION POLICY

The Energy Bar Association (EBA), the Charitable Foundation of the Energy Bar Association (CFEBA), and the Foundation of the Energy Law Journal (FELJ) are committed to the goals of fostering an inclusive and diverse membership and increasing diversity across all levels of the Associations. Attorneys, energy professionals and students with varied and diverse characteristics practicing in the energy field are welcome to join our ranks, regardless of race, creed, color, ethnicity, Native American, Alaska, or Hawaiian Native tribal membership or descendance, gender (including gender identity or expression), sexual orientation, family and marital status (including pregnancy), family responsibilities, religion, national origin, age, personal appearance, political affiliation, veterans status, disability, source of income (government, solo, corporate, firm practice), or place of residence or business (geographic diversity) and are encouraged to become active participants in the Associations' activities.

PRESIDENT'S MESSAGE

As I write this message, we continue to grapple with today's energy industry challenges – from a strained supply chain to ongoing extreme weather patterns to ever-changing regulations – as we look into the future (and past) to attempt to plot the best path forward. Whatever part Energy Bar Association members and the broader Energy Law Journal readership play in this industry, it is safe to state that our objective is securing a reliable and sustainable power supply, to build resilient systems, and to ensure sound financing and to enable just and reasonable rates. However, the uncertainty created by today's challenges means predicting the path toward these objectives – and requirements – for tomorrow is all the more difficult.

Through this Spring edition of the Energy Law Journal, we see that our industry is facing this uncertainty by continuing to examine tough questions to navigate through new and increasingly complex legal landscapes. This issue contains Commissioner Mark Christie's article entitled "It's Time to Reconsider Single-Clearing Price Mechanisms in U.S. Energy Markets," Marcia Hook, et al.'s "Hydrogen's Potential Role in LDCS' Transition to a Low-Carbon Future," David Smith's "Carbon Capture and Sequestration – 'Essential,' But Too Little, Too Late?," and Scott Gaille's and Tanner Harris's, "Control, Fault, and Knock-for-Knock: A Guide to Selecting Indemnities in Energy Construction and Services Agreements."

As my year as President ends, I'm proud of EBA's successes over the last year, particularly in the many meaningful engagement opportunities we have provided to our members and sponsors, innovative programming formats and topics, professional development and outreach opportunities, and refreshed website. The EBA continues to be a convening place where energy professionals and attorneys can share ideas, and this Journal continues to be a resource where authors can share broadly well-thought-out paths to that better energy future. Moreover, as I look to the year ahead under new leadership, I am pleased to say that I have faith that we are poised to continue raising the bar for members with respect to the value that EBA provides to each of us.

It is a great privilege to be affiliated with the Energy Law Journal and with the team of professionals that work so hard to uphold the national standard of excellence it exemplifies. I am grateful for the contributions made by the many volunteers who work behind the scenes to make this Journal possible. I especially want to thank the Journal's Editor-in-Chief, Harvey Reiter, Executive Editor Caileen Gamache, and Administrative Editor Nicholas Cicale. Furthermore, the Journal is sustained by the financial stewardship of the Foundation of the Energy Law Journal, this year led by President Holly Rachel Smith. Thank you all for your tireless efforts.

Finally, thank you, dear reader, for allowing the Energy Bar Association to be of service to you and for your generous participation and support.

Sincerely,
/s/ *Delia D. Patterson*
Delia D. Patterson
President, Energy Bar Association

EDITOR IN CHIEF'S PAGE

Mid-November 2022. It seems like such a short time ago that the last edition of this Journal went online. Yet, when we look back I'm guessing that most of us will have forgotten many of the dramatic events of the past six months, or at least put those memories in deep storage. As has been my custom in prior editions of the Journal, I thought I'd take us on a short trip down memory lane and provide a snapshot of what was taking place in the world around us when the latest edition was put to bed by our erstwhile authors, peer review editors and student editors.

And I've added a small twist. It has been hard to ignore stories about advances in artificial intelligence – computer programs that can mimic the work of famous artists, create photorealistic fake pictures and videos, compose news stories. One computer creation – a new song seemingly sung by Drake – was downloaded several hundred times before it was taken down. And we've seen AI's quirks and deep flaws. One enterprising reporter armed with knowledge of computer logic systems coaxed an AI bot to confess its love for him and to urge him to leave his wife! So what is the twist? There is a paragraph in this Editor's Page that I did not write. It was created by ChatGPT. Can you tell which one? Read on. I'll let you know at the end.

The Changed Legal Landscape

- **Constitutionality of investigative hearings, ALJ structure**

In a 9-0 decision, the Supreme Court ruled that private parties could bring direct constitutional challenges to the FTC's and SEC's in-house enforcement proceedings in federal district courts without first appealing the agencies' decisions.[1] The Court's decision did not rule on the constitutionality of the claims the plaintiffs had brought against the FTC and the SEC – namely whether (1) the agencies could conduct in –house administrative proceedings to enforce their statutory schemes and (2) ALJs can constitutionally be afforded procedural protections against removal. The latter issue is before the Supreme Court in the government's petition for certiorari to review the Fifth Circuit's decision in *Jarkesy et al. v. SEC* declaring that SEC ALJs have unconstitutional removal protections.[2] While the cases by their terms applied only to the SEC and the FTC, the Court's ruling could open avenues to challenge the similar structure of other regulatory agencies, including FERC.

- **What is substantial evidence?**

Practitioners before FERC have long understood that to pass muster under the FPA's and NGA's substantial evidence standard, there must be "more than a

1. Axon Enter., Inc. v. FTC, et al., 2023 WL 2938328, No. 21-1239 (S. Ct Apr.14, 2023).

2. Jarkesy et al. v. SEC, 34 F.4th 446 (5th Cir. 2022), *petition for certiorari pending*, *SEC v. Jarkesy et al*., No. 20-61007.

scintilla of evidence" to support the agency's fact findings,[3] and that while it cannot disregard contrary evidence,[4] neither is it bound by a weight of the evidence standard.[5] But the Fifth Circuit, which has previously held that the agency's finding will be upheld even where conflicting evidence of "equivalent quality" supports a contrary conclusion,[6] appears to be moving away from that standard in a ruling enjoining parts of an FDA rule authorizing the use of mifepristone, a ruling subsequently stayed by the Supreme Court.[7]

- **The Rising proliferation of "Major Question Doctrine" cases**

Last spring I wrote an article for Energy Brief warning of the implications for regulatory stability if the greatly expanded "major questions doctrine" discussed in two "shadow docket" cases were adopted in the then impending *West Virginia v. EPA* decision.[8] The Court, as most readers will know by now, did adopt the doctrine in that case and it has produced a spate of challenges to regulatory actions in federal district and appellate courts in the ensuing year.[9] Counting the shadow docket decisions in 2021 and 2022, the Supreme Court alone has taken up MDQ questions five times in 2021 and 2022,[10] more than in the entire prior

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3. Consolidated Edison Co. v. NLRB, 305 U.S. 197 (1938).

4. Universal Camera Corp. v. NLRB, 340 U.S. 474, 488 (1951).

5. S. Carolina Pub. Serv. Auth. v. FERC, 762 F.3d 41, 54 (D.C. Cir. 2014).

6. Nat'l Grain and Feed Ass'n v. OSHA, 866 F.2d 717, 740 (5th Cir. 1988).

7. *See, e.g.,* Alliance for Hippocratic Med., et al. v. FDA, No. 23-10362 (5th Cir. 2023) (upholding injunction against use of mifepristone without prior doctor's visit or beyond seven weeks as likely "arbitrary and capricious" without considering whether substantial evidence supported agency's findings that serious adverse effects from permitted use of the drug were "exceedingly rare"). *See* Emergency Motion Under Rule 27.3 for a Stay Pending Appeal, Alliance for Hippocratic Med., et al. v. FDA, No. 23-10362 (filed Apr. 10, 2023), *stay granted*, Danco Labs., LLC v. Alliance for Hippocratic Med., et al., No. 22A901 (S. Ct. Apr. 21, 2023). Justice Alito would have denied the stay, concluding that the movants had not shown irreparable harm. His reasoning: that the government likely would not enforce the Fifth Circuit's ruling anyway ("The Government has not dispelled legitimate doubts that it would even obey an unfavorable court order in these cases . . . .") *Id*. at 3-4.

8. Harvey L. Reiter, *Would FERC's Landmark Decisions Have Survived Review Under the Supreme Court's Expanding "Major Questions Doctrine" And Could The Doctrine Stifle New Regulatory Initiatives?*, 3 EBA Brief 1 (2022), https://www.eba-net.org/wp-content/uploads/2023/01/EBA_Brief_V3-1.pdf.

9. Kentucky v. Biden, 23 F.4th 585 (6th Cir. 2022) (denying stay of lower court order Enjoining Property Act rule mandating that the employees of federal contractors in "covered contract[s]" with the federal government become fully vaccinated against COVID-19. Injunction granted on grounds that rule was violative of MQD); Georgia v. President of the United States, 46 F.4th 1283 (11th Cir. 2022) (narrowing the nationwide scope of the injunction); Brown v. Dept. of Educ., No. 4:22-cv-0908-P, 2022 WL 16858525 (N.D. Tex. Nov. 10, 2022) (finding the debt relief plan violated MQD); Louisiana v. Biden, 585 F. Supp. 3d 840 (W.D. La. 2022) (Cain - social cost of carbon Executive order - reversed on appeal by 5th Cir. as not final agency); Oklahoma v. Biden, 577 F. Supp. 3d 1245 (W.D. Okla. 2021) (rejecting Oklahoma's challenge to vaccine mandate for National Guard members - not a "major question"); United States v. Empire Bulkers Ltd., 583 F.Supp.3d 746 (E.D. La. 2022) (rejecting criminal defendant's charge that regulation cited in indictment was violation of major questions doctrine); Kovac v. Wray, 363 F.Supp.3d 721 (N.D. Tex. 2023) (accepting claim that government's terrorist watchlist regulations violated MQD and bemoaning fact that Sup. Ct says clear statement only applies to "major questions" - but finding "clear" authorization for watchlist to be used in screening airline passengers); Loper Bright Enterprises, Inc. v. Raimondo, 45 F.4th 359 (D.C. Cir. 2022) (stating issue as: did Congress authorize the National Marine Fisheries Service to make herring fishermen in the Atlantic pay the wages of federal monitors who inspect them at sea?); Ohio v. Yellen, 53 F.4th 983 (6th Cir. 2022) (determining plaintiff could have, but failed to challenge regulation as violative of the underlying statute under MQD); Health Freedom Def. Fund, Inc. v. Biden, 599 F. Supp. 3d 1144 (M.D. Fla. 2022) (upholding challenge to CDC mask mandate on public transit as violative of MDQ as alternative ground to finding Chevron deference inapplicable).

10. Alabama Assoc. of Realtors v. Dept. of Health and Human Servs., 141 S. Ct. 2485 (2021); Nat. Fed'n of Indep. Bus. v. OSHA, 142 S. Ct. 661 (2022); West Virginia v. EPA, 142 S. Ct. 2587 (2022); Biden v. Missouri, 142 S. Ct. 647 (2022) (four dissenting Justices stating that vaccine requirement for hospitals receiving Medicare funding violated MDQ); Biden v. Nebraska/U.S. Dept. of Educ. v. Brown, Nos. 22-506, 22-535 (S. Ct. Jan. 4, 2023) (student loan forgiveness).

history of the Court. This was foreseeable despite the Court's characterization of the doctrine as one reserved for "extraordinary cases."[11] The doctrine declares agency actions of "vast economic and political significance" as presenting major questions and holds that such actions are ultra vires if they do not rely on express Congressional authorization.[12] But it defines neither standard, creating an open invitation to mount MDQ challenges, an invitation, it seems, that litigants are taking up with great frequency.[13]

- **Antitrust**

"I need to make antitrust sexy again."

Senator Amy Klobuchar discussing scheduled hearings on LiveNation/Ticketmasters's alleged monopolistic ticketing practices.[14]

"Industry consolidation and unfair practices, discriminatory conduct, that all sounds really boring, but it sounds a lot more interesting when a Taylor Swift fan is putting it to music," she added in a reference to then-circulating TikTok videos about Ticketmaster's control of the live concert ticket market.[15]

Not only Congress, but the antitrust enforcement agencies have taken a more aggressive stance against what they consider anticompetitive practices and mergers. In early April, the FTC ordered Illumina, which manufactures gene-sequencing machines, to divest itself of Grail, a cancer-test developer with which it had already merged following an ALJ's approval of the merger.[16]

Unscrambling a merger, while uncommon, is not without precedent. And it has happened in the natural gas industry. In 1962, the Supreme Court reversed the Federal Power Commission's approval of El Paso Natural Gas Company's acquisition of the stock of Pacific Northwest Pipeline Company, a merger the Justice Department's antitrust division was then challenging in court. The FPC had no authority to immunize mergers from the antitrust laws, it held, and accordingly should have delayed action on the application until the antitrust proceedings had concluded.[17] But the merger had already been consummated and, when the Supreme Court later upheld the Justice Department's antitrust challenge to the merger, El Paso was forced to divest itself of the other pipeline.[18] While FERC has conditioned many of them, it has been decades since it has disallowed an electric utility merger. How a more aggressive FTC and DOJ merger policy might affect merger applications coming before FERC may be material for future articles in this Journal.

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11. West Virginia v. EPA, 142 S. Ct. 2587, 2595 (2022).

12. *Id.* at 2595, 2605.

13. Donald Goodson, of NYU's Institute for Policy Integrity, takes a more sanguine view in his article appearing the spring edition of the ELJ's sister publication, Energy Brief. *See* Donald L.R. Goodson, *The Impact of West Virginia v. EPA on Challenges to FERC's Authority Under the Major Questions Doctrine*, 4 EBA Brief 10 (2023), https://www.eba-net.org/wp-content/uploads/2023/04/EBA-Brief-Vol-4-Issue-1-2023.pdf. He argues that major economic and political significance has been replaced by a narrower test – whether the rule is "unheralded and transformative." *Id.*

14. *Highlights from the Ticketmaster hearing: Senators criticize 'monopoly' over Taylor Swift fiasco*, NBC NEWS, https://www.nbcnews.com/politics/congress/live-blog/ticketmaster-taylor-swift-senate-committee-hearing-live-updates-rcna66687 (last updated Jan. 24, 2023).

15. *Id.*

16. *Steve Lohr, F.T.C. Orders Gene-Sequencing Company Illumina to Divest Acquisition*, N.Y. TIMES (Apr. 3, 2023), https://www.nytimes.com/2023/04/03/business/ftc-illumina-grail-divest.html#:~:text=F.T.C.%20Orders%20Gene%2DSequencing%20Company%20Illumina%20to%20Divest%20Acquisition.

17. California v. FPC, 369 U.S. 482 (1962).

18. United States v. El Paso Natural Gas Co., 376 U.S. 651 (1964).

- **Second Amendment jurisprudence**

The Supreme Court's *Bruen* opinion expanding the Second Amendment to include the right to carry guns outside the home[19] continues to have ripple effects. Federal law prohibits the possession of firearms by persons subject to domestic violence protective orders.[20] Zackey Rahimi was made subject to such a protective order after assaulting his former girlfriend, but was later "involved in five shootings in and around Arlington, Texas" and indicted for possessing a firearm while subject to a protective order.[21] Citing *Bruen*, the Fifth Circuit declared the law unconstitutional. The law, it reasoned, was not "consistent with the Nation's historical tradition of firearm regulation"[22] because there were no analogous firearm regulations or laws either at the nation's founding nor at the time the Fourteenth Amendment was ratified – "an outlier that our ancestors would never have accepted."[23] Wow.

Physical Threats to the Grid

"FBI thwarts neo-Nazi plot to attack Baltimore Gas & Electric substations, 'completely destroy' city." That was the headline in a February 2023 article in Utility Dive.[24] Matthew Olsen, assistant attorney general for national security, described the arrests of Sarah Beth Clendaniel and Brandon Clint Russell this way: "Driven by their ideology of racially-motivated hatred, the defendants allegedly schemed to attack local power grid facilities."[25]

This attack, unfortunately, was not an isolated incident. The same Utility Dive article cites federal government warnings in 2022 "that domestic terrorists had developed 'credible, specific plans' to attack the U.S. power grid."[26] Citing a report from the U.S. General Accounting Office, Newsweek reported that "[i]n the first eight months of 2022, the U.S. electrical grid was physically attacked 107 times."[27] These events were at least in part a motivation for FERC's December 15, 2022 order directing NERC to prepare a report analyzing the effectiveness of current NERC standards to address physical threats to the Bulk Power grid.[28] That report has now been released.[29]

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19. N.Y State Rifle & Pistol Ass'n v. Bruen, 142 S. Ct. 2111 (2023).

20. 18 U.S.C. § 922(g)(8) (2022).

21. United States v. Rahimi, 59 F. 4th 163, 168 (5th Cir. 2023).

22. *Id.* at 172.

23. *Id.* at 179.

24. Robert Walton, *FBI thwarts neo-Nazi plot to attack Baltimore Gas & Electric substations, 'completely destroy' city,* UTILITY DIVE (Feb. 7, 2023), https://www.utilitydive.com/news/fbi-thwarts-neo-nazi-plot-to-attack-baltimore-gas-electric-substations/642147/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202023-02-07%20Utility%20Dive%20Newsletter%20%5Bissue:47873%5D&utm_term=Utility%20Dive.

25. *Id.*

26. *Id. See also* Ilana Krill & Bennett Clifford, MAYHEM, MURDER, AND MISDIRECTION: VIOLENT EXTREMIST ATTACK PLOTS AGAINST CRITICAL INFRASTRUCTURE IN THE UNITED STATES, 2016-2022 (2022), G.W. UNIV., https://extremism.gwu.edu/sites/g/files/zaxdzs2191/f/CriticalInfrastructureTargeting09072022.pdf.

27. Tom O'Connor & Naveed Jamali, *Domestic Terrorists Could Take Out U.S. Power Grid—and Attacks Have Started*, NEWSWEEK (Jan. 1, 2023), https://www.newsweek.com/2023/01/20/domestic-terrorists-could-take-out-us-power-grid-attacks-have-started-1772786.html.

28. *N. Am. Elec. Reliability Corp*., 181 FERC ¶ 61,230 (2022).

29. N. AM. ELEC. RELIABILITY CORP., EVALUATION OF THE PHYSICAL SECURITY RELIABILITY STANDARD AND PHYSICAL SECURITY ATTACKS TO THE BULK-POWER SYSTEM (2023), https://www.nerc.com/FilingsOrders/us/NERC Filings to FERC DL/NERC Report on CIP-014-3.pdf.

Climate Change Red Alerts

Warnings about the accelerating pace of climate change continue to make the news. A March 2023 report of the U.N.'s Intergovernmental Panel on Climate Change (IPCC) "found that the world is likely to surpass its most ambitious climate target — limiting warming to 1.5 degrees Celsius (2.7 degrees Fahrenheit) above preindustrial temperatures — by the early 2030s."[30] As Washington Post reporter Sarah Kaplan recounts, the report warns that if temperature increases exceed that target "climate disasters will become so extreme that people will not be able to adapt. Basic components of the Earth system will be fundamentally, irrevocably altered. Heat waves, famines and infectious diseases could claim millions of additional lives by century's end."[31] Less than a month later, Jianjun Yin, a climate scientist at the University of Arizona, reported his findings that sea levels along the Gulf Coast have risen by "nearly five inches" since 2010 and that NOAA data indicates that the sea level near New Orleans is now "eight inches higher than it was in 2006, just after Hurricane Katrina."[32]

The dire messages these reports convey, if anything, make two recent dystopian works – *The Deluge*, a novel by Stephen Markley and *Extrapolations* – a miniseries on AppleTV+ – even more terrifying. Both stories are set in the near future and depict with eerie plausibility the consequences of inaction on climate issues.[33]

National Security

- **Leaks of classified material**

Security experts will be wondering long after publication of this edition of the Journal how a twenty-one year old National Guardsman could obtain access to, copy and release to the world top secret documents about Ukrainian and Russian war plans and preparedness. The internet posting of these documents and the subsequent arrest of Massachusetts Air National Guard member Jack Teixeira sent shock waves through the intelligence community.

- **Chinese spy surveillance balloon**

The nation's attention was captured for a week in late January and early February as a Chinese spy surveillance balloon travelled across the United States. It was ultimately shot down over the coast of South Carolina. A subsequent leak of classified documents describe four other such spy balloons of which U.S. intelligence was aware, raising already high tensions between the US and China.[34]

War Crimes and More War

In March, the International Criminal Court issued an arrest warrant for Russian President Vladimir Putin, accusing him of committing war crimes directly and focusing "on the unlawful deportation of children from Ukraine to Russia, a

30. Sarah Kaplan, *World is on brink of catastrophic warming, U.N. climate change report says*, WASH. POST (Mar. 20, 2023), https://www.washingtonpost.com/climate-environment/2023/03/20/climate-change-ipcc-report-15/.

31. *Id.*

32. Chris Mooney & Brad Dennis, *Seas have drastically risen along Gulf Coast*, WASH. POST (Apr. 10, 2023), https://www.washingtonpost.com/climate-environment/2023/04/10/sea-level-rise-southern-us/.

33. I have not thought of myself as a glutton for the dystopian, but have to admit I'm looking forward to the next season of Handmaid's Tale.

34. Evan Hill et al., *Leaked secret documents detail up to four additional Chinese spy balloons*, WASH. POST (Apr. 14, 2023), https://www.msn.com/en-us/news/world/leaked-secret-documents-detail-up-to-four-additional-chinese-spy-balloons/ar-AA19SLwK.

charge also brought against Maria Lvova-Belova, Russia's – if you can believe it – commissioner for children's rights.[35]

Four years after the overthrow of Sudanese dictator Omar al-Bashir, civilian control of Sudan remains elusive. Hundreds of Sudanese civilians were killed in April as fighting broke out between the military and a major paramilitary group that overthrew the short-lived civilian government in 2021.[36]

Bank Collapse

Unprepared for rising interest rates and holding too much near zero interest Treasury bonds, Silicon Valley Bank collapsed from lightning-like flight of depositors in early March. It was the second largest bank failure in U. S. history.[37]

Speakership Battle

It took 15 rounds of votes and a number of promises to holdouts no longer on the fringes of his party, but Kevin McCarthy achieved his dream of becoming Speaker of the House.

Debt Ceiling Cliff

The drama over the debt ceiling will almost certainly still be ongoing when this edition of the Journal goes online. The constitutionality of the debt ceiling – a statutory limit on the executive branch's authority to pay for debts already incurred – has been debated by academics[38] as both a violation of the Constitution's Borrowing Clause[39] and section four of the Fourteenth Amendment.[40] And it has been raised many times in our history without debate – three times alone during the last Administration, for example. But the current majority in the House of Representatives, while agreeing that default on our debt would be catastrophic, is insisting on cuts to *future* spending as a condition of agreeing to pay for *past* debts. The President, meanwhile maintains that he will not bargain over the full faith and credit of the United States. Hang on for what is sure to be an unnecessarily scary ride.

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35. Antoinette Radford & Frank Gardner, *The International Criminal Court (ICC) has issued an arrest warrant for Russian President Vladimir Putin*, BBC NEWS (Mar. 18, 2023), https://www.bbc.com/news/world-europe-64992727.

36. Katharine Houreld & John Hudson, *Civilian toll rises in Sudan as military, rivals fight for control*, WASH. POST (Apr. 16, 2023), https://www.washingtonpost.com/world/2023/04/16/sudan-conflict-rapid-support-forces-military/.

37. Jim Tankersley, *How Silicon Valley Bank's Failure Could Have Spread Far and Wide*, N.Y. TIMES (Apr. 13, 2023), https://www.nytimes.com/2023/04/13/us/politics/silicon-valley-bank-widespread-failure.html.

38. Thomas Geoghegan, *The Constitutional Case for Disarming the Debt Ceiling*, NEW REPUBLIC (Jan. 6, 2023), https://newrepublic.com/article/169857/debt-ceiling-law-terminate-constitution.

39. Article I, section 8 reads: "The Congress shall have Power to Lay and Collect Taxes, Duties, Imposts, *to pay the Debts* and provide for the Common Defence and General Welfare of the United States; To borrow money on the credit of the United States." (emphasis added). U.S. Const. art. 1, § 8. Geoghegan argues that Congress has the power to borrow, only on the condition of its use to prevent a default, quoting Hamilton Federalist Number 30, "Who would lend to a government that would preface its overture for borrowing by an act which demonstrated that no reliance could be placed on the steadiness of its measure for paying for it?" Geoghegan, *supra* note 38.

40. Section 4 of the Fourteenth Amendment says, in part: "The validity of the public debt of the United States, authorized by law, including debts incurred for the payment of pensions and bounties for service in suppressing insurrection or rebellion, shall not be questioned." U.S. Const. amend. XIV, § 4.

Lame Duck Session of Congress

The lame duck session of Congress, which ended after the ELJ's fall edition, was noteworthy for two bipartisan pieces of legislation. Congress amended the Electoral Count Act to emphasize the purely ministerial role played by a Vice President in counting electoral votes. And it passed a law adding protections for gay and interracial marriage.

The Fake News Network?

"I hate him passionately."

So wrote Tucker Carlson (subsequently fired by Fox, but then offered a job on the Russian state media network RT) in describing his feelings toward Donald Trump. This email was part of a treasure trove of internal Fox emails disclosed during discovery in Dominion Voting Systems defamation suit against NewsCorp, the parent company of Fox News.[41] In the months leading up to Dominion's scheduled April 17 defamation trial against Fox excerpts from scores of emails depicted executives and on air personalities as loathe to describe election conspiracies as bunk at the risk of alienating the network's audience.[42] The trial judge had already ruled on summary judgment that claims that Dominion had altered votes were lies. The issue at the trial therefore, had it been held, was whether or not the lies the network aired about Dominion's voting machines were deliberate falsehoods or at least broadcast with reckless disregard for their truth or falsity.[43] Acknowledging the judge's findings, and avoiding trial, Fox settled the lawsuit by agreeing to pay Dominion more than three quarters of a billion dollars in damages. "Lies have consequences," said Dominion's lawyer, Justin Nelson.[44]

Fox still faces a similar defamation suit by Smartmatic, another manufacturer of voting machines.[45] And Dominion still has defamation lawsuits pending against Rudolph Guiliani, Sydney Powell, Mike (the pillow guy) Lindell and against the Newsmax and OneAmerica broadcast networks.

Another Big Defamation Case

Several years ago the former president responded to a claim by E. Jean Carroll that he had once raped her by allegedly disparaging her and claiming she "wasn't my type." The latter then brought a defamation case in New York. Trump had moved to dismiss the suit on grounds that his statements were immunized because he was acting "within the scope of his duties as U.S. President." The DC Court of Appeals rejected that claim, finding that under DC law the question wasn't whether his actions were within the scope of his employment, but whether they were in furtherance of his duties to the government. That fact question the

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41. Sarah Ellison, *Trump Spurred an 'existential crisis' at Fox News, lawsuit exhibits show*, WASH. POST (Mar. 7, 2023), https://www.washingtonpost.com/media/2023/03/07/fox-news-dominion-tucker-carlson-texts/.

42. As NPR reporters David Folkenflik and Mary Yang described Fox's internal documents: "Primetime stars Tucker Carlson, Laura Ingraham and Sean Hannity privately trashed the people who lied about Dominion on their network's airwaves and yet also trashed the reporters who sought to hold them accountable for those lies." David Folkenflik & Mary Yang, *Fox News settles blockbuster defamation lawsuit with Dominion Voting Systems*, NPR (Apr. 18, 2023), https://www.npr.org/2023/04/18/1170339114/fox-news-settles-blockbuster-defamation-lawsuit-with-dominion-voting-systems.

43. New York Times Co. v. Sullivan, 376 U.S. 254, 279-280 (1964).

44. David Folkenflik & Mary Yang, *Fox News settles blockbuster defamation lawsuit with Dominion Voting Systems*, NPR (Apr. 18, 2023), https://www.npr.org/2023/04/18/1170339114/fox-news-settles-blockbuster-defamation-lawsuit-with-dominion-voting-systems.

45. Amy B Wang, et al., *Fox News still faces $2.7 billion defamation lawsuit from Smartmatic*, WASH. POST (Apr. 19, 2023), https://www.washingtonpost.com/media/2023/04/18/fox-news-smartmatic-defamation-lawsuit/.

DC Court of Appeals left for the federal courts in New York to decide.[46] Trump repeated the same remarks after he'd left the Presidency and was sued by Carroll again. The defamation trial in *that* case began in late April. After less than three hours of deliberation a unanimous, mostly male jury found Trump liable for sexually abusing and defaming Ms. Carroll.

Chutzpah and Profiles in Half-Courage

Former Vice President Mike Pence, threatened with death by a Trump-inspired mob and willing to write a book about Jan 6th, nonetheless refused to testify under oath before the Jan. 6th Committee on grounds that doing so would be a violation of the separation of powers between the executive branch (him) and the legislative branch (the Jan. 6th Committee). Then, months later, when subpoenaed by the Justice Department (the executive branch) he also opposed the subpoena on "separation of powers" grounds – arguing that on Jan. 6th he was part of the legislative branch (president of the Senate) and couldn't honor a subpoena by the same executive branch he claimed to be part of months earlier.[47] Chutzpah.[48]

In what conservative commentator Charlie Sykes referred to as a "profile in half courage,"[49] more than two years after the January 6th attacks, the former Vice President chose a closed-door, untelevised event – the annual Gridiron Dinner – to lay the blame squarely on the former President for the violence on January 6, 2021:

"President Trump was wrong. I had no right to overturn the election. And his reckless words endangered my family and everyone at the Capitol that day. And I know that history will hold Donald Trump accountable."[50]

More chutzpah

The former president made more news with the announcement in April that he had filed a lawsuit – for $500 million – against his former attorney Michael Cohen. Trump's claim was not for defamation but for alleged violation of a non-disclosure agreement. Trump's complaint simultaneously alleges both that Cohen disclosed confidential attorney-client communications in his book *and* that what the book discussed was "spreading falsehoods," i.e, did not contain Trump's communications.[51] Go figure.

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46. Trump v. Carroll, No. 22-SP-745, 2023 WL 2920882 (D.C. Apr. 13, 2023). Adding some drama to his already dubious "not my type" defense, an unsealed deposition transcript showed that Trump had misidentified a picture of a younger Carroll as Marla Maples, one of his former wives. Elizabeth Hartfield & Kara Scannel, *Donald Trump mistook E. Jean Carroll for his ex-wife Marla Maples in a photo, deposition transcripts show*, CNN (Jan. 20, 2023), https://www.cnn.com/2023/01/19/politics/trump-e-jean-carroll-deposition-photo/index.html.

47. Pence later chose not to appeal the court order rejecting his claim and testified before a grand jury.

48. The D.C. Circuit has defined chutzpah as follows: "Chutzpah is a young man, convicted of murdering his parents, who argues for mercy on the ground that he is an orphan." Harbor Ins. Co. v. Schnabel Found. Co., 946 F.2d 930, 937 n.5 (D.C. Cir. 1991). *See also* Marks v. Comm'r of Internal Revenue, 947 F.2d 983, 986 (D.C. Cir. 1991) (discussing the D.C. Circuit's "developing chutzpah doctrine").

49. Charlie Sykes, *Why Not Pence?*, BULWARK (Mar. 13, 2023), https://morningshots.thebulwark.com/p/why-not-pence. Sykes's remarks were an allusion to Profiles in Courage, the Pulitzer prize-winning book by the late President John F. Kennedy.

50. David Jackson, *Pence says history will hold Trump 'accountable' for Jan. 6, rebukes him for endangering his family*, USA TODAY (Mar. 12, 2023), https://www.usatoday.com/story/news/politics/2023/03/12/pence-jan-6-history-hold-trump-accountable/11459297002/.

51. Kelly Garrity, *Trump sues his former fixer Michael Cohen for over $500 million*, POLITICO (Apr. 12, 2023), https://www.politico.com/news/2023/04/12/trump-sues-ex-lawyer-michael-cohen-00091735.

Mass shootings

Firearms had already become the number one cause of death among children in 2020.[52] And we have become numb to the number of mass shootings. Already scaringly frequent, they now number nearly *two* per day, double the itself staggering mass shooting figure of one per day from 2014-2019.[53] While correlation and causation are not the same, it is hard to dismiss the correlation between the increase in mass shootings and the proliferation of weapons generally (with no corresponding increase in mental illness),[54] and the exponential increase in private ownership of assault rifles.[55] And because only 32 percent of American adults own firearms,[56] with estimates of 400 million firearms in circulation (more that the total US population including children),[57] the mathematical implication is that many gun owners must literally wield arsenals.

Among the many mass shootings in the last six months was another mass school shooting at a private school in Tennessee. When three legislators subsequently took to the Tennessee house floor out of order to protest state inaction on gun violence the heavily gerrymandered legislature voted to expel two of them for this rules violation – Justin Pearson of Memphis and Justin Jones of Nashville – but spared by one vote the expulsion of Gloria Johnson.[58] The legislature's actions appear to have backfired. The expelled legislators were both reappointed to their seats in less than a week and both conservative Governor Lee and Lt. Gov. McNally have now come out in support of red flag laws.[59]

Orwellian

Speaker of the House, Kevin McCarthy chose to provide Tucker Carlson "exclusive access" to the Jan. 6 videos. McCarthy described his decision as an effort to promote "transparency," but Carlson's subsequent selective use of video clips to describe the attacks as peaceful and orderly "tourist" visits to the Capitol were trashed by Republican Senators.[60]

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52. *Preventing Gun Violence, the Leading Cause of Childhood Death*, NAT'L INSTITUTES OF HEALTH (July 5, 2022), https://www.nichd.nih.gov/about/org/od/directors_corner/prev_updates/gun-violence-July2022.

53. Nadine Yousif, *Why number of US mass shootings has risen sharply*, BBC NEWS (Mar. 28, 2023), https://www.bbc.com/news/world-us-canada-64377360.

54. Gun industry sales have grown 11% per year between 2018 and 2023. *Gun & Ammunition Stores in the US - Market Size 2002*–2028, IBIS WORLD, https://www.ibisworld.com/industry-statistics/market-size/gun-ammunition-stores-united-states/#:~:text=past%205%20years%3F-,The%20market%20size%20of%20the%20Gun%20%26%20Ammunition%20Stores%20industry%20in,average%20between%202018%20and%202023 (last updated Sept. 30, 2022).

55. Joe Walsh, *Record 2.8 Million AR-15 And AK-Style Rifles Entered U.S. Circulation In 2020, Gun Group Says,* FORBES (July 20, 2022), https://www.forbes.com/sites/alisondurkee/2022/07/20/record-28-million-ar-15-and-ak-style-rifles-entered-us-circulation-in-2020-gun-group-says/?sh=1248ebd527ca ("Manufacturing figures for AR-15 and AK-style rifles, minus exports, have exploded in recent decades, from fewer than 100,000 annually in the late 1990s—when many of those firearms were prohibited for civilian use under the 1994-2004 federal assault weapons ban—to more than 1 million every year since 2015" and 2.8 million in 2020.).

56. Lydia Saad, *What Percentage of Americans Own Guns?*, GALLUP (Nov. 13, 2020), https://news.gallup.com/poll/264932/percentage-americans-own-guns.aspx.

57. Walsh, *supra* note 55.

58. Liz Crampton, *Tennessee Republicans may have just handed a lifeline to Democrats,* POLITICO (Apr. 12, 2023), https://www.politico.com/news/2023/04/12/tennessee-democrats-justin-jones-pearson-00091631.

59. Emily Chochrane, *Second Expelled Democrat is Sent Back to Tennessee House*, N.Y. TIMES (Apr. 12, 2023), https://www.nytimes.com/2023/04/12/us/justin-pearson-tennessee-house-vote.html#:~:text=Second%20Expelled%20Democrat%20Is%20Sent%20Back%20to%20Tennessee%20House.

60. Paul Kane, et al., *'Just a lie': Senate Republicans blast Tucker Carlson's Jan. 6 narrative*, WASH. POST (Mar. 8, 2023), https://www.washingtonpost.com/politics/2023/03/07/tucker-carlson-jan-6-senate-republicans/.

Speaking of Orwellian use of common words, the Ohio legislature passed a law this winter defining natural gas as green energy. [61]

Indictments, investigations, civil litigation and the former President

In the weeks leading up to his indictment for falsifying business records to cover up hush money payments to a porn star in advance of the 2016 presidential election, the former president posted a picture of himself brandishing a baseball bat, juxtaposed to a picture of Manhattan District Attorney Alvin Bragg (see below), warning in his post of "potential death and destruction" if he were to be indicted.[62] Hours later Bragg received a written death threat in a mailed envelope also ominously containing white powder (that fortunately turned out to be non-poisonous).[63]

Unhinged

"I am your retribution."

In the months preceding his verbal attack on Manhattan's district attorney, the former President began his nascent campaign for the presidency with this vengeful declaration at one of his first campaign rallies.[64] This outburst followed his widely criticized decision to invite not one, but two Holocaust deniers – Kanye West and Nick Fuentes – to an intimate dinner at Mar-a-Lago.[65]

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61. Jane Zuckerman, *With a stroke of his pen, Gov. DeWine defines natural gas as green energy*, CLEVELAND.COM (Jan. 6, 2023), https://www.cleveland.com/open/2023/01/with-stroke-of-his-pen-gov-mike-dewine-defines-natural-gas-as-green-energy.html?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202023-01-09%20Utility%20Dive%20Newsletter%20%5Bissue:47156%5D&utm_term=Utility%20Dive. *See also* Maxine Joselow, *How dark money groups led Ohio to redefine gas as 'green energy'*, WASH. POST (Jan. 17, 2023), https://www.washingtonpost.com/climate-environment/2023/01/17/ohio-natural-gas-green-energy/.

62. Lee Brown & Steven Nelson, *Trump posts disturbing baseball bat photo with Alvin Bragg, threatens 'death and destruction'*, N.Y. POST (Mar. 24, 2023), https://nypost.com/2023/03/24/trump-shares-pic-holding-baseball-bat-near-das-head/.

63. Michael R. Sisak, Associated Press, *Powder, threatening letter sent to Manhattan district attorney investigating Trump*, PBS, (Mar. 24, 2023), https://www.pbs.org/newshour/politics/powder-threatening-letter-sent-to-manhattan-district-attorney-investigating-trump.

64. Aaron Blake, *Trump's dark 'I am your retribution pledge – and how GOP enabled it*, WASH. POST (Mar. 6, 2023), https://www.washingtonpost.com/politics/2023/03/06/trumps-dark-i-am-your-retribution-pledge-how-gop-enabled-it/.

65. Maeve Reston & Kristen Holmes, *Trump hosted Holocaust denier at Mar-a-Lago estate during visit with Kanye West, a week after announcing 2024 run*, CNN (Nov. 26, 2022), https://www.cnn.com/2022/11/25/politics/trump-kanye-west-nick-fuentes-mar-a-lago/index.html.

Sports

My apologies to the Detroit Lions. In the last edition of the Journal I referred to the "lowly" Lions' victory over the Packers as evidence of Aaron Rodgers's declining skills. But the Lions went on to win eight of their last ten games. And while they did not make the playoffs (a fate the Lions have shared with Detroit's Tigers, Redwings and Pistons since 2019), commentators did consider them to be the best team that didn't make the playoffs.

Argentina won the World Cup in a thrilling overtime victory over France in Qatar amidst controversy over corruption in the selection of the host country. Soccer great Lionel Messi's final World Cup triumph was followed a few weeks later with the death of 82 year old Pele, maybe the greatest soccer player ever.

Hall of Fame pitcher Gaylord Perry, notorious for throwing a spitball, passed away on December 1. He was also such a notoriously bad hitter that his manager, Alvin Dark, once said "there'll be a man on the moon before he hits a homerun." Perry did hit a homerun. It was on July 20, 1969, the same day Neil Armstrong became the first man to walk on the moon. As Perry remarked, "Dark was right, but only by an hour."[66]

Chicago Black Hawks left winger (a hockey position, not a political orientation) Bobby Hull passed away at 84. The "Golden Jet" led the NHL in goals seven times. While he and Detroit Redwing great Gordie Howe were rivals for most of their long careers, they paired up, briefly, for 8 games in 1981 with the Hartford Whalers before both retired.

The announced sale of the NFL's Washington Commanders by owner Daniel Snyder made the front page of the Washington Post's April 14, 2023 edition with a summary of an article in the paper's sports section reading: "New owner's best quality? He's not Daniel Snyder." And the sports section itself proclaimed that when the sale was announced "local sports talk radio stations opened [their] lines to ecstatic listeners."[67]

George Santos

It turns out that George Santos, newly elected to Congress from Long Island, lied to voters about, well everything. And in a real twist, here was a politician who lied that he *was* Jewish. Incredibly, after being denounced by his own party leaders in New York, and despite "facing multiple investigations from the House Ethics Committee and law enforcement," Santos has announced that he will run for reelection.[68] He was subsequently charged in federal court with campaign finance violations.

January 6th Committee Report

The Jan 6th Committee issued its final report, recommending criminal charges against former President Trump to DOJ. Meanwhile, two of his avid supporters – far right Oath Keeper leaders Stewart Rhodes and Kelly Megs – were convicted of seditious conspiracy, as were Enrique Tarrio and three other members of the Proud Boys.[69]

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66. Harrison Smith, *Gaylord Perry, spitball-throwing Hall of Famer, dies at 84*, WASH. POST (Dec. 1, 2022), https://www.washingtonpost.com/obituaries/2022/12/01/pitcher-gaylord-perry-dead/.

67. Scott Allen, et al., *On a 'national holiday' for Commanders fans, stadium talk intensifies*, WASH. POST (Apr. 13, 2023), https://www.washingtonpost.com/sports/2023/04/13/commanders-sale-fans-stadium/.

68. Ben Jacobs, *George Santos is running for reelection because "good isn't good enough*", VOX (Apr. 18, 2023), https://www.vox.com/politics/2023/4/17/23687258/george-santos-running-for-reelection.

69. *Leader of Oath Keepers and Oath Keepers Member Found Guilty of Seditious Conspiracy and Other Charges Related to U.S. Capitol Breach*, DEP'T OF JUSTICE, OFFICE OF PUB. AFFAIRS (Nov. 29, 2022),

Judicial Propriety

The Supreme Court has come under increased scrutiny as the only federal court whose members are not bound by the judicial code of ethics.[70] One of its members, Justice Thomas, has faced questions about his previously undisclosed receipt of lavish gifts and vacations from a wealthy friend as well as unreported income from the sale of his mother's home (which she continues to occupy) to that same friend.[71] And federal district court judge Matthew Kacsmaryk, the author of a nationwide injunction barring the use of mifesprestone (later suspended), has come under fire for failing to disclose his connection to an article he had submitted to a University of Texas law journal prior to hearings on his 2017 nomination to serve on the federal bench. A report in the Washington Post detailed an email Kacsmaryk had sent to the journal months after the article had been submitted, asking that his name be taken off the article for "reasons I may discuss at a later date."[72] This was significant, the report explained, for two reasons. At the time the email was sent, he was under consideration by the White House for a judicial appointment. And the draft law review article itself argued that physicians "cannot use their pens to prescribe abortifacient drugs designed to kill unborn children."[73]

Speech Police

- **Big Brother**

Former President Clinton famously remarked during his 1996 State of the Union address that "The era of Big Government is over."[74] In announcing the opening of Florida's legislative session, its governor might well have proclaimed that the "the era of Big Brother is just starting." Barring cruise lines during the height of COVID from requiring crews and passengers to be vaccinated, stripping Disney of its authority to run the local utility as punishment for criticism of his "don't say gay" bill, blocking state money for a Tampa Bay Rays training facility after a team tweet against gun violence[75] – these were apparently just the start.

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https://www.justice.gov/opa/pr/leader-oath-keepers-and-oath-keepers-member-found-guilty-seditious-conspiracy-and-other; Ella Lee, *4 Proud Boys, including leader Enrique Tarrio, guilty of seditious conspiracy for Jan. 6 Capitol attack*, USA TODAY (May 4, 2023), https://www.msn.com/en-us/news/us/4-proud-boys-including-leader-enrique-tarrio-guilty-of-seditious-conspiracy-for-jan-6-capitol-attack/ar-AA1aJS2m?ocid=entnewsntp&pc=U531&cvid=a9069325929b4921b876147d2cdb0e26&ei=16.

70. *Supreme Court Justices Should Follow Binding Code of Ethics, ABA House Says*, AM. BAR ASS'N (Feb. 27, 2023), https://www.americanbar.org/advocacy/governmental_legislative_work/publications/washingtonletter/feb-23-wl/scotus-ethics-0223wl/#:~:text=While%20Supreme%20Court%20justices%20must,report%20accompanying%20the%20resolution%20says.

71. *Justice Thomas faces new scrutiny for real estate deal with Republican donor*, PBS (Apr. 13, 2023), https://www.pbs.org/newshour/show/justice-thomas-faces-new-scrutiny-for-real-estate-deal-with-republican-donor; Eugene Robinson, *Clarence Thomas's explanations fail the laugh test*, WASH. POST (Apr. 18, 2023), https://www.washingtonpost.com/opinions/2023/04/17/clarence-thomas-disclosures-harlan-crow-respect/.

72. Caroline Kitchener, et al., *The controversial article Matthew Kacsmaryk did not disclose to the Senate*, WASH. POST (Apr. 15, 2023), https://www.washingtonpost.com/politics/2023/04/15/matthew-kacsmaryk-law-review/.

73. *Id.*

74. '*The era of big government is over': CNN transcript of President Clinton's radio address*, CNN (Jan. 27, 1996), http://www.cnn.com/US/9601/budget/01-27/clinton_radio/.

75. Steve Contorno, *DeSantis blocks state money for Tampa Bay Rays training facility after team tweets against gun violence*, CNN (June 3, 2022), https://www.cnn.com/2022/06/03/politics/ron-desantis-tampa-bay-rays-gun-violence/index.html. His latest act of retaliation against Disney – a threat to construct a prison on vacant land bordering Disney's property – evoked criticism from past and current governors in his party that his actions were anti-business and not conservative. Kierra Frazier, '*So unnecessary': Republicans pile on DeSantis over Disney*, POLITICO, https://www.politico.com/news/2023/04/18/chris-christie-ron-desantis-disney-00092505 (last

Since winning reelection, the likely presidential aspirant has made Big Brother initiatives a hallmark of his new term. After the College Board criticized his decision to strip AP African American Studies classes from high school curriculums, he threatened to block the teaching of *all* AP courses.[76] He has promoted the creation of private causes of action against companies that choose to provide employees with diversity training and pushed legislation to strip state universities of control over their own curriculums and directed teachers in public schools to refer to transgender students by their sex assigned at birth. And in a legislative session not yet over, he has signed bills "banning abortion after six weeks of pregnancy and broadening the death penalty by eliminating the requirement for a unanimous verdict,"[77] and in the wake of daily mass shootings nationwide, he signed a bill authorizing permitless carry of concealed weapons.[78]

These are all proposals that have become, or are almost certain to become law by a rubber stamp legislature that would make Xi Jinping blush. But chilling debate hasn't been limited to the acts of the Florida legislature. The state's board of education has banned teaching about sexual orientation or gender identity even in high school.[79] Would a high school civics teacher discussing the Supreme Court's decision in *Obergefell v. Hodges* face dismissal?

- **Heckler's Veto**

Lacking the power of government, but no less offensive was the treatment of conservative Fifth Circuit Judge Kyle Duncan by the students *and* a faculty member at Stanford Law School. In his career before taking the bench, Duncan had litigated many cases against gay and transgender rights. Students opposed to his viewpoints shouted down the judge during his attempted remarks. But rather than trying to restore order, Associate Dean Tirien Steinbach instead posed this question to the judge, "Is the juice worth the squeeze?" – suggesting that there was no worthwhile purpose in espousing views that might upset the students. This response rightly drew both an apology to the speaker and condemnation of the students' uncivil conduct from the school's dean, who reminded students and faculty that freedom of speech was not limited to those with whom one shares the same views.[80]

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updated Apr. 19, 2023). Disney has since sued DeSantis, maintaining that his actions amounted to unconstitutional retaliation for Disney's exercise of its First Amendment rights. Walt Disney Parks and Resorts U.S., Inc. v. DeSantis, et al. No. 4:23-cv-00163-M (N.D Fla Apr. 26, 2023).

76. Nicholas Reimann, *DeSantis Threatens Florida Ban Of AP Classes In Latest College Board Jab*, FORBES (Feb. 13, 2023) https://www.forbes.com/sites/nicholasreimann/2023/02/13/desantis-threatens-florida-ban-of-ap-classes-in-latest-college-board-jab/?sh=33206882f11f. *See also* Ana Ceballos, *Florida rejects AP African American Studies course, claiming it 'lacks educational value'*, MIAMI HERALD (Jan. 23, 2023), https://www.miamiherald.com/news/local/education/article271362032.html#storylink=cpy.

77. Tim Craig & Lori Rozsa, *How DeSantis became Florida's most powerful governor in a generation*, WASH. POST (Apr. 18, 2023), https://www.washingtonpost.com/nation/2023/04/16/florida-ron-desantis-governor-legislature-power.

78. Christopher Spata, *Florida concealed carry goes permitless, and gun instructors hope for the best*, TAMPA BAY TIMES (Apr. 4, 2023), https://www.tampabay.com/news/florida/2023/04/04/florida-concealed-carry-goes-permitless-gun-instructors-hope-safety/.

79. Hannah Natanson, *Florida bans teaching about gender identity in all public schools*, WASH. POST (Apr. 19, 2023), https://www.washingtonpost.com/education/2023/04/19/florida-bans-teaching-gender-identity-sexuality/.

80. Ruth Marcus, *Stanford students lost a chance to learn when they shouted down a judge*, WASH. POST (Mar. 27, 2023), https://www.washingtonpost.com/opinions/2023/03/27/stanford-law-free-speech-judge-stuart-kyle-duncan/. Duncan did not escape Marcus's criticism either. She decried as a "flimsy excuse for intolerance" his stated grounds in one case for refusing to refer to a transgender inmate by the pronoun of her choice: that doing so "may unintentionally convey [the court's] tacit approval of the litigant's underlying legal position." *Id.*

- **Drag shows**

Who would have thought that the need to ban drag shows would become a thing? Days after an earlier picture of him dressed in drag in his high school yearbook was published, Tennessee Governor Bill Lee nonetheless signed into law a statute criminalizing drag shows that that might be seen by children, i.e., available publicly.[81] The law would prohibit public "adult cabaret performances" by "male or female impersonators." Would that mean banning TV broadcasts of Dustin Hoffman in Tootsie and Robin Williams in Mrs. Doubtfire, or Martin Lawrence in Big Mamma's House, or John Travolta in Hairspray? Or maybe YouTube-accessible comedy sketches featuring a younger Donald Trump in drag? How about Kate McKinnon's impersonations of Rudolph Guliani and Jeff Sessions on Saturday Night Live? Challenges to the law no doubt await.

Earthquake in Turkey and Syria

One of the most devastating earthquakes in recent history rocked parts of Turkey and Syria in early February, killing tens of thousands and damaging or destroying hundreds of thousands of buildings, leaving many survivors homeless.[82] Recovery efforts in the latter country have been further complicated by the ongoing civil war there.

Gone but not forgotten

Last month Ben Ferencz passed away. At the age of 103 he was the sole surviving Nuremberg Nazi war crimes prosecutor. Diminutive in physical stature, but a towering figure in the fight for human rights, Ferencz urged the creation of an international court that could prosecute any government's leaders for war crimes. The 2002 establishment of the International Criminal Court in The Hague saw his hopes realized.[83]

Pope Benedict XVI, the 265th Pope of the Catholic Church, passed away on December 31, 2022, at the age of 94. His death was announced by the Vatican, and tributes poured in from around the world, including from his successor, Pope Francis.[84] Benedict had resigned from the papacy in 2013 due to health reasons, becoming the first Pope in over 600 years to do so.[85] He was widely respected for his theological writings and was known for his conservative views on issues such as homosexuality, contraception, and the ordination of women.[86] Despite criticism

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81. Gloria Oladipo, *Tennessee governor to ban drag shows – despite photo of him dressed in drag*, GUARDIAN (Feb. 28, 2023), https://www.theguardian.com/us-news/2023/feb/28/tennessee-governor-ban-drag-shows-photo-bill-lee.

82. Zeynep Bilginsoy & Suzan Fraser, Associated Press, *Turkey, Syria face more loss after latest earthquake*, PBS (Feb. 21, 2023), https://www.pbs.org/newshour/world/turkey-syria-face-more-loss-after-latest-earthquake.

83. Mike Schneider *Ben Ferencz, last living Nuremberg prosecutor of Nazis, dies*, Washington Post (April 8, 2023),
https://www.washingtonpost.com/politics/2023/04/08/holocaust-nuremberg-nazis-jews-prosecution/6436aa18-d64b-11ed-ac8b-cd7da05168e9_story.html.

84. "Pope Benedict XVI, former leader of Catholic Church, dies at 94," NBC News, April 15, 2022, https://www.nbcnews.com/news/world/pope-benedict-xvi-former-leader-catholic-church-dies-94-rcna20613 .

85. "Pope Benedict XVI," Biography.com, accessed April 21, 2023, https://www.biography.com/religious-figure/pope-benedict-xvi.

86. "Pope Benedict XVI's Legacy: Conservative, Intellectual and Authoritative," The New York Times, February 11, 2013, *https://www.nytimes.com/2013/02/12/world/europe/pope-benedict-xvis-legacy-conservative-intellectual-and-authoritative.html.*

from some quarters, Benedict remained a popular figure among many Catholics and was seen as a steadfast defender of traditional Church teachings.[87]

Barbara Walters died at age 93 on December 30, 2022. The first woman to anchor a network news show and the first anchor, male or female, to earn an annual salary of $1 million, gained her greatest fame for her interviews with the powerful and famous – including a joint interview with Anwar Sadat and Menachem Begin, an interview with Richard Nixon and interviews with both Monica Lewinsky and Hilary Clinton.[88]

Scientific Breakthrough

Last December scientists at the National Ignition Facility did what had eluded their predecessors for decades – produce more energy from a fusion explosion than the energy used to spark the fusion reaction. Commercially viable carbon-free, radioactive-free power stations may still be far off, but the breakthrough suggests it is possible.[89]

Looking Forward

It has been a whirlwind six months. The Federal Energy Regulatory Commission is still short a fifth commissioner, but the world moves on. We've finally emerged from the worst of the COVID pandemic; President Biden has formally declared that the National Health Emergency will end on May 11. One thing has remained constant about the work of the Journal, though. Our authors, peer review editors and student editors - volunteers all - continue to devote their time and skills to produce a Journal of which the Energy Bar Association can be proud. I want to express a special thanks to the Journal's outgoing student editor-in-chief – Sotheby Shedeck – for her tireless and excellent work. Our authors – typically practitioners, regulators and policymakers with heavy workloads – will often have to fit their writing efforts within our publication schedule. There are predictably unpredictable changes to deadlines that our students must then accommodate. Sotheby and her staff have handled these with grace and patience and deserve our thanks.

You're probably still waiting to discover which of the paragraphs of this Editor's Page was created by ChatGPT. It was the paragraph about the death of Pope Benedict. Was there a giveway? Well the footnotes created by the computer program were not in blue book form. Congratulations if you guessed correctly.

Harvey Reiter
Washington, DC May 2023

87. "Pope Benedict XVI remembered as a 'great man of faith' after his death," The Guardian (April 15, 2022), https://www.theguardian.com/world/2022/apr/15/pope-benedict-xvi-remembered-as-a-great-man-of-faith-after-his-death.

88. Lawrence I. Barrett*, Barbara Walters, TV's tireless pursuer of the newsmaker 'get,' dies at 93*, WASH. POST (Dec. 31, 2022), https://www.washingtonpost.com/obituaries/2022/12/30/barbara-walters-tv-dies/.

89. Dan Cleary, *With historic explosion, a long sought fusion breakthrough*, SCIENCE (Dec. 13, 2022), https://www.science.org/content/article/historic-explosion-long-sought-fusion-breakthrough.

IN MEMORIAM: CHARLES E. "CHUCK" BULLOCK

Charles E. "Chuck" Bullock was born in September, 1946. He grew up in Mechanicsburg, Pennsylvania and graduated from Bucknell University in 1968; Chuck received his Juris Doctor degree from George Washington University Law School in 1971. He was a member of the Bar of the District of Columbia and a long-time member of the Energy Bar Association.

In 1972, Chuck began his career as a young trials lawyer in the Pipeline Rate Division at the Federal Power Commission where he was mentored by Assistant General Counsel, Jack Lotis. Chuck himself went on to become the first Assistant General Counsel of Pipeline Rates at the Federal Energy Regulatory Commission from 1977 to 1984. During that period countless lawyers benefited from Chuck's mentoring. In 1984 Chuck became an Administrative Law Judge at the FERC where he presided over hearings and issued Initial Decisions in complex cases involving natural gas pipelines and electric utilities.

After serving 24 years at the FERC, in 1996 Chuck was appointed an ALJ at the Environmental Protection Agency. In that position, he conducted hearings and wrote initial decisions in enforcement proceedings brought under a number of environmental laws.

In 2002, Chuck was appointed Administrative Law Judge at the United States International Trade Commission where he conducted hearings and made initial determinations in the agency's investigation of uniform practices in import trade. In 2011, Chuck was appointed Chief Administrative Law Judge at the USITC. As Chief Judge, he traveled widely sharing his expertise with officials in various countries.

In December of 2021, Chuck retired from 50 years of government service and got to spend valuable time with the love of his life, "Bitsy," who he married in 1973 and with whom had two sons, Ryan and Bennett.

The Energy Bar Association is very proud of Chuck's 50 years of serving the public interest. His leadership and mentoring skills will live on as a role model for all of EBA's members.

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IT'S TIME TO RECONSIDER SINGLE-CLEARING PRICE MECHANISMS IN U.S. ENERGY MARKETS

By Mark C. Christie[*]

I. INTRODUCTION

For more than two decades, American power markets[1] operated by regional transmission organizations (RTOs)[2] have used "single-clearing price" (SCP)

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* Commissioner, Federal Energy Regulatory Commission (FERC or Commission). Commissioner, Virginia State Corporation Commission (2004-2021). This article benefitted from a plethora of good suggestions, valuable criticism, historical recollections and technical assistance from many, including the author's former colleagues at the Virginia State Corporation Commission, Judith Williams Jagdmann and James C. Dimitri, and members of the Christie office team at FERC, including Neil G. Yallabandi and Regine Baus. The views expressed herein, however, are solely those of the author and do not necessarily represent the views of commenters, nor do they represent the official position of the Commission. The author does not express any opinion herein on any specific formal matter currently pending before the Commission or that may come before the Commission in the future, and nothing herein should be so interpreted.

1. Kathryne Cleary & Karen Palmer, *U.S. Electricity Markets 101*, RES. FOR THE FUTURE (Mar. 17, 2022), https://www.rff.org/publications/explainers/us-electricity-markets-101/. This article focuses on three major types of U.S. power markets. Described in more detail below, they include (i) real-time energy markets, in which physical electrical power is traded in real time, (ii) day-ahead markets, in which prices and commitments for next-day delivery of electrical power are traded, and (iii) capacity markets, in which promises to deliver power resources in the future, are sold, bought and priced.

2. "RTOs" are the regional transmission organizations that meet the criteria set forth in Final Rule, *Regional Transmission* Organizations, 65 Fed. Reg. 810 (1999) (to be codified at 18 C.F.R. pt. 35), Order No. 2000, FERC Stats. & Regs. ¶ 31,089 (1999) (cross-referenced at 89 FERC ¶ 61,285), *order on reh'g*, Order No. 2000-A, FERC Stats. & Regs. ¶ 31,092 (2000) (cross-referenced at 90 FERC ¶ 61,201), *aff'd sub nom.* Pub. Util. Dist. No. 1 of Snohomish Cty. v. FERC, 272 F.3d 607 (D.C. Cir. 2001); *see also* Morgan Stanley Cap. Grp. Inc. v. Pub. Util. Dist. No. 1, 554 U.S. 527 (2008) [hereinafter Order No. 2000]. Herein the term "RTO" also includes the single and multi-state Independent System Operators (ISOs) that qualify under Order No. 2000.

mechanisms. Such mechanisms are also used in power markets in the United Kingdom, Europe, Asia and other parts of the world.[3]

A single-clearing price mechanism broadly means that all sellers offering power or a power-related service receive the same clearing price. This clearing price is the *highest* price that it takes to meet full demand. As a result, sellers that have offered to sell at prices lower than the clearing price, including those offering at zero or even below zero due to out-of-market subsidies, still receive the highest clearing price. As consumers' power bills continue to rise, however, both the EU and UK are reconsidering whether the continued use of SCP mechanisms is in the best interests of hard-pressed consumers and whether changes to pricing structures need to be made to give consumers the full potential cost savings available from low to zero marginal cost resources.[4] Some experts experienced in RTO markets in the United States have recently begun questioning the continued use of single-clearing price mechanisms in American power markets as well.[5]

This article makes several arguments:

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3. *Action and measures on energy prices*, EUROPEAN COMM'N, https://energy.ec.europa.eu/topics/markets-and-consumers/action-and-measures-energy-prices_en ("The wholesale market in the EU is a system of marginal pricing, also known as pay-as-clear market, where all electricity generators get the same price for the power they are selling at a given moment. . . . The bidding goes from the cheapest to the most expensive energy source. The cheapest electricity is bought first, next offers in line follow. Once the full demand is satisfied, everybody obtains the price of the last producer from which electricity was bought."). On February 8, 2023, the author discussed with members and staff of the Central Electricity Regulatory Commission of India the use of SCP mechanisms in Indian power markets.

4. *See* Alice Hancock & Richard Milne, *Brussels plans energy market overhaul to curb cost of renewables*, FIN. TIMES (Jan. 1, 2023), https://www.ft.com/content/9c92f25d-26ee-40ae-b043-eb6cd7a22211 ("Brussels plans to overhaul the bloc's electricity market to prioritise cheaper renewable power . . . the commission suggests making renewable power more reflective of its 'true production costs', given that once the infrastructure is built, the energy source for a wind farm or solar array is essentially free."). *See also* Natalie Thomas, *UK looks to break link between soaring gas and power prices*, FIN. TIMES (Oct. 1, 2022), https://www.ft.com/content/b47e542c-de63-4f49-8ec6-9a459d28fe97 ("Pricing in Britain's wholesale electricity market, like on the continent, is based on 'short-run marginal costs.' Every electricity generator puts a bid in but the daily market price is set at the level that ensures there will be sufficient supply to meet demand. In other words, the price is always set by the most expensive plant . . . ."); John Norris & Rich Heidorn Jr., *EU Retreat from Competition, Ukraine Conflict Seen Impacting US Energy Markets*, RTO INSIDER (Sep. 19, 2022), https://www.rtoinsider.com/articles/30796-eu-retreat-competition-ukraine-conflict-impacting-us-energy-markets ("Europe appears to be retreating from electric competition and single-price clearing auctions, trends that could spread to the U.S., MIT professor Michael Mehling told the Independent Power Producers of New York. . . ."); Kate Abnett, *EU sets sights on energy market reform as prices soar*, REUTERS (Aug. 30, 2022), https://www.reuters.com/business/energy/eu-sets-sights-energy-market-reform-prices-soar-2022-08-30/ ("In the current system the EU wholesale electricity price is set by the last power plant needed to meet overall demand. Gas plants often set that price, which countries including Spain have said is unfair because it means cheap renewable energy is sold at the same price as costlier fossil fuel-based power.").

5. Tony Clark & Vincent Duane, STRETCHED TO THE BREAKING POINT RTOS AND THE CLEAN ENERGY TRANSITION, WILKINSON BARKER KNAUER, LLP (2021), https://wbklaw.wpenginepowered.com/wp-content/uploads/2021/07/Wholesale-Electricity-Markets-White-Paper-07.08.21.pdf (Clark is a former FERC commissioner and Duane was senior vice president of law, compliance and external affairs at PJM for many years); *see also* Bernard L. McNamee, *Time to Update Wholesale Electric Markets – But Don't Forget the Benefits of Traditional Utility Regulation*, REAL CLEAR ENERGY (Apr. 8, 2021), https://www.realclearenergy.org/articles/2021/04/08/time_to_update_wholesale_electric_markets__but_dont_forget_the_benefits_of_traditional_utility_regulation_771956.html. McNamee is also a former FERC commissioner.

First, that it is timely for the United States to join the UK and EU in a comprehensive reconsideration of the pricing mechanisms used in our power markets and to ask whether those pricing mechanisms can or will, in the future, deliver the best combination of cost savings and reliable power supply to consumers. It is especially timely to ask, as the EU is asking, whether single-clearing price mechanisms are best suited to deliver to consumers all of the potential cost savings from the increasing deployment of heavily subsidized, very low to below-zero marginal-cost resources such as wind and solar.[6]

Second, that the need for this reconsideration of pricing mechanisms should focus immediately on capacity markets. These constructs are critically important not only because of their impact on the costs consumers pay for power resources, but on the reliability of the power grid itself. Indeed, it is past time to reconsider whether such constructs, certainly those in the large, multi-state RTOs, are still capable of performing the important duties expected of them.

Third, that the reconsideration of SCP mechanisms in our power markets should not be limited to capacity markets. Unlike capacity markets, real-time energy and day-ahead markets use a different single-clearing price mechanism, the very granular SCP mechanism called Locational Marginal Pricing (LMP). While acknowledging that there are serious arguments in favor of continued use of the LMP mechanism in certain markets,[7] the article asserts that such arguments should not prevent an open-minded consideration of equally serious arguments made against continued use of single-clearing price mechanisms in U.S. power markets, including the practical question whether LMP itself, which may be effective in some scenarios, can continue to deliver what it promises under today's conditions.[8] Because of the vital role played by the real-time and day-ahead markets in balancing supply and demand, a rigorous reconsideration of SCP mechanisms such as LMP must proceed with care and caution, but it should proceed and it should not come with preconditions as to what can be reconsidered and what cannot be.

Fourth, the article emphasizes that any serious reconsideration of power market pricing mechanisms must include examining the broader historical context in

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6. Norris & Heidorn, *supra* note 4 ("[MIT professor Mehling] said [e]conomists and policymakers must determine whether single-price clearing markets still make sense as the fuel mix shifts to one dominated by low variable cost renewables that often produce negative prices.").

7. William W. Hogan, *Electricity Market Design and Zero-Marginal Cost Generation*, SPRINGER (Feb. 24, 2022), https://link.springer.com/article/10.1007/s40518-021-00200-9; Scott Harvey & William Hogan, *Locational Marginal Prices and Electricity Markets*, LMP MKT. DESIGN (Oct. 17, 2022), https://lmpmarketdesign.com/papers/locational_marginal_prices_and_electricity_markets_hogan_and_harvey_paper_101722.pdf. Hogan is the Raymond Plank Research Professor of Global Energy Policy, John F. Kennedy School of Government, Harvard University. *Id.* He is one of the world's leading experts on power market design and in whose Kennedy School seminars the author has frequently enjoyed participating and learning. *Id.* Harvey is a consultant with FTI Consulting and a member of the California ISO/Western EIM Market Surveillance Committee. *Id.*

8. Clark & Duane, *supra* note 5.

which they were adopted, as they were key features of the power industry "deregulation"[9] movement of the late 1990s and early 2000s. Reconsidering these pricing mechanisms thus requires a candid reassessment of the assumptions that drove deregulation and whether those assumptions still apply to present reality. The use of single-clearing price mechanisms was integral to deregulation with its establishment of RTOs and RTO power markets. These "markets," however -- despite the label -- have never have been true markets, but rather administrative constructs with some market characteristics.[10] The questions about SCP mechanisms raised in this article cannot be divorced from the question whether these markets were based on deregulation assumptions that may no longer be valid, if they ever were.

Fifth, the article also emphasizes that, for those defending current single-clearing price mechanisms, it is not enough to argue purely from economic "textbook" theory and ignore the present realities driving market operations and results, especially in the large, politically diverse, multi-state RTOs.[11] Even the most ardent advocates of RTO markets admit that certain public policies, especially subsidies, that have been widely adopted since the advent of those markets, are antithetical to their efficient operation.[12] So any serious reconsideration of single-clearing price mechanisms cannot be confined to textbook economic theory, but must take into account how public policies have distorted the pricing mechanisms in RTO power markets that use marginal costs to determine outcomes and how these policies are likely to continue to do so. For if prices are the "keys to the RTO kingdom . . . what happens when price is no longer an effective tool for fulfilling the tasks that RTOs were created to complete?"[13]

So a serious reconsideration will evaluate how the messy real world of conflicting policies and politics, especially in the large, multi-state RTOs, affects their abilities to operate markets that deliver just and reasonable rates to consumers[14] and promote reliability.

Similarly, and especially with regard to capacity markets, a consideration of alternatives should ask whether accountability to the public in a democratic system is best served when it is elected state policy-makers and state regulatory authorities

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9. A note about terminology: What took place during this period was not the "deregulation" of a previously regulated electric power industry, similar to what took place with airlines, trucking and railroads in the 1970s, but a replacement of one heavily regulated construct with different ones. "Restructuring" is a more accurate term and came to replace the term "deregulation" as this fact became obvious. Nevertheless, for consistency, this article uses the term "deregulation" throughout. *See infra*, note 10.

10. Another note about terminology: This article uses the short-hand term "markets" for these administrative constructs known as RTO power markets, but the use of the term "markets" does not change the assertion herein that these are administrative constructs with some market characteristics, not true markets. As with the term "deregulation," the use of the term "markets" has always been more of a branding exercise by advocates than an accurate description, an exercise that George Orwell would recognize. *See supra*, note 9.

11. "[LMP] is the . . . *textbook* ideal that *should* be the target for policy makers." Hogan, *supra* note 7, at 17 (emphasis added).

12. *Id.* at 20 ("Subsidies produce unintended consequences and undermine the incentives provided by markets. . . . 'Subsidies are contagious. Competition in the markets could be replaced by competition to receive subsidies.'") (internal citation omitted).

13. Clark & Duane*, supra* note 5, at 1.

14. Federal Power Act, 16 U.S.C. § 824d (2018); *see also* 16 U.S.C. § 824e (2005).

who have the clear and acknowledged responsibility to ensure their load-serving utilities have sufficient power resources to meet demand at prices consumers can afford, not RTO managers, RTO market participants and RTO member interest groups.[15]

Finally, as in any debate on a major issue of public policy, the most important question always evokes the Henny Youngman punch line "compared to what?" That is because choosing public policies *always* involves tradeoffs and any criticism of one policy must consider criticisms of alternative policies. So any serious reconsideration of single-clearing price mechanisms in U.S. power markets must evaluate just as critically the alternatives and their advantages and disadvantages. Without providing specific answers to the questions raised herein, the article asserts that the need to consider them is timely and compelling.

II. WHAT IS A SINGLE-CLEARING PRICE MECHANISM?

One of the most succinct and understandable descriptions of single-clearing price mechanisms and how they work in power markets is found in a U.S. Supreme Court opinion written by Justice Elena Kagan. It is worth quoting liberally herein. Referring to RTO power markets, Justice Kagan wrote:

> These wholesale auctions serve to balance supply and demand on a continuous basis, producing prices for electricity that reflect its value at given locations and times throughout each day. Such a real-time mechanism is needed because, unlike most products, electricity cannot be stored effectively. Suppliers must generate— every day, hour, and minute—the exact amount of power necessary to meet demand from the utilities and other "load-serving entities" (LSEs) that buy power at wholesale for resale to users. To ensure that happens, wholesale market operators obtain (1) orders from LSEs indicating how much electricity they need at various times and (2) bids from generators specifying how much electricity they can produce at those times and how much they will charge for it. *Operators accept the generators' bids in order of cost (least expensive first) until they satisfy the LSEs' total demand. The price of the last unit of electricity purchased is then paid to every supplier whose bid was accepted, regardless of its actual offer* . . . .[16] So, for example, suppose that at 9 a.m. on August 15 four plants serving Washington, D. C. can each produce some amount of electricity for, respectively, $10/unit, $20/unit, $30/unit, and $40/unit. And suppose that LSEs' demand at that time and place is met after the operator accepts the three cheapest bids. *The first three generators would then all receive $30/unit.* That amount is (think back to Econ 101) the marginal cost—i.e., the added cost of meeting

15. FERC regulates RTOs and RTO markets to ensure just and reasonable rates to consumers, but FERC has no authority to order a load-serving public utility to build a specific generation facility, only states can. 16 U.S.C. § 824; *see also* Hughes v. Talen Energy Mktg., 578 U.S. 150, 154 (2016) ("The States' reserved authority includes control over in-state 'facilities used for the generation of electric energy.'" (quoting 16 U.S.C. § 824(b)(1)); 16 U.S.C. § 824o(a)(3) ("The term 'reliability standard' means a requirement, approved by the Commission under this section, to provide for reliable operation of the bulk-power system. The term includes requirements for the operation of *existing bulk-power system facilities*, including cybersecurity protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for reliable operation of the bulk-power system, but the term does *not* include any requirement to enlarge such facilities *or to construct new transmission capacity or generation capacity*.") (emphasis added).

16. FERC v. Elec. Power Supply Ass'n, 577 U.S. 260, 268 (2016) (emphasis added).

> another unit of demand—which is the price an efficient market would produce.[17] FERC calls that cost (in jargon that will soon become oddly familiar) the locational marginal price, or LMP.[18]

This is as good a basic description for non-lawyers and non-economists as one will find as to how a single-clearing price mechanism works. Justice Kagan is describing a specific SCP mechanism, LMP, which is used in American real-time and day-ahead power markets. RTO capacity markets, it should be noted, use single-clearing price mechanisms but do not use LMP, as we will discuss below.

The Harvey-Hogan paper, which strongly advocates for the continued use of the single-clearing price mechanism of LMP in real-time and day-ahead markets, offers additional detail about how this mechanism specifically works:

> [LMP] has two important characteristics. First, the prices are calculated from the system operator's actual operational security constrained economic dispatch solution for balancing load and generation. LMP prices support balanced supply and demand at each location and account for market participants bids and offers, the physical constraints of the transmission system and physical constraints on resource operation such as upper operating limits, and ramp rates. Second, LMPs settlements are based on market clearing prices, as opposed to pay-as-bid pricing designs used to determine . . . payments in non-LMP pricing systems. . . . A crucial element of LMP pricing is that it settles all resource injections and withdrawals at the same location at the same point in time at the same market clearing spot price. . . .
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> In LMP markets, prices can vary by location at each interconnection point (node) on the transmission system and by time in five-minute increments.[19]

The single-clearing price mechanism of LMP has three elements: an energy charge, a congestion charge and a charge for transmission system energy losses. Consequently, LMP can and usually does vary substantially across the RTO based on the presence of transmission constraints that prevent lower-cost generation from being dispatched.[20] These transmission elements in LMP can be valuable metrics in assisting RTO transmission planners: "[w]hen there are transmission constraints, the highest variable cost unit that must be dispatched to meet load within transmission-constrained boundaries will set the LMP in that area. All sellers receive the LMP for their location and all buyers pay the price for their location."[21]

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17. *Id.* (citing Alfred E. Kahn, The Economics Of Regulation: Principles And Institutions 65-67 (John Wiley & Sons, Inc., 1971).

18. *Id.* (emphasis added). While giving appropriate kudos to Justice Kagan, in her more extensive explanation of RTO markets she also relied upon FERC's own Energy Primer as a key source for her explanation. *Id*. at 267-68 (citing FERC, ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS 58–59 (2015), https://www.ourenergypolicy.org/wp-content/uploads/2016/01/energy-primer.pdf). If it's good enough for Justice Kagan, it's good enough for the author, who will rely on the latest version of the ENERGY PRIMER, published in April 2020, herein. FERC, ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS (2020), https://www.ferc.gov/sites/default/files/2020-06/energy-primer-2020_0.pdf.

19. Harvey & Hogan, *supra* note 7.

20. ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS, *supra* note 18, at 64.

21. *Id*. at 65. See also Scott Miller, *Not 'sick or dying or dead': The great benefit of RTOs,* UTILITY DIVE (Mar. 23, 2023), https://www.utilitydive.com/news/rto-iso-benefits-regional-transmission-west/645776/

III. SCP'S CRITICAL ROLE IN THE DEREGULATION OF THE POWER INDUSTRY

Reconsideration of the use of single-clearing price mechanisms cannot be separated from an examination of what was called the deregulation[22] of the power industry during the 1990s and early 2000s,[23] because the use of such price mechanisms was a vital feature of the economic theory that underpinned deregulation and the RTO power markets created to implement it.

Deregulation was considered the textbook solution to the cost overruns of rate-based generation assets in the 1970s and 1980s, especially nuclear units.[24] During the movement's heyday in the late 1990s and early 2000s, deregulating states ordered their vertically integrated electric utilities to divest generation assets completely or at least "functionally separate" those assets into a separate generating company (a/k/a "genco") within a holding company structure.

The economic theory driving restructuring was that the wires network, which includes transmission and distribution components, was a natural monopoly and

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("The grid that is dispatched as a network based on a Security Constrained Economic Dispatch (SCED) is very different from a grid based on the limitations of the contract path . . . . Thus, the RTO dispatch reveals transmission upgrades based on a fully utilized grid revealing areas of congestion on a larger view."); *Cf.* Clark & Duane, *supra* note 5, at 8-10 (discussion of the use of LMP in transmission planning).

22. *See supra* notes 9-10 (re terminology).

23. There were, of course, some antecedents to the deregulation movement of the 1990s. FERC's actions during that era were rooted, at least in part, in earlier legislative and regulatory efforts intended to use competition to protect consumers from exercises of market power by monopoly utilities. The literature recounting the history is voluminous and to recount it all here would be the fish that swallowed the whale. Among the most informative and well-written accounts are: Hon. Joseph T. Kelliher, *Market Manipulation, Market Power, and the Authority of the Federal Energy Regulatory Commission*, 26 ENERGY L.J., 1, 5-11 (2005) (Kelliher is a former member and chairman of FERC); Harvey Reiter, *The Contrasting Policies of the FCC and FERC Regarding the Importance of Open Transmission Networks in Downstream Competitive Markets*, 57 FED. COMM. L.J. 243, 255-61 (2005) (detailing the history of efforts to open up access to transmission assets prior to Order No. 888); Harvey Reiter, *Competition and Access to the Bottleneck: The Scope of Contract Carrier Regulation under the Federal Power and Natural Gas Acts*, 18 LAND AND WATER L. REV. 1, 3-10 (1983) (which was prescient in forecasting and advocating for the type of open access to monopoly-owned transmission networks that was enacted in FERC Order No. 888 over a decade later - both Kelliher and Reiter 2005 highlight the important role of the Public Utility Regulatory Policy Act (PURPA), Pub. L. 95-617, 92 Stat. 3117 (Nov. 9, 1978) in laying the groundwork for the deregulation of the 1990s, because PURPA required monopoly utilities to purchase power, under certain circumstances, from a new class of generators which were not owned by the utility). For a well-written and persuasively critical view of deregulation's early phase, including FERC's role, *see* Tyson Slocum, *The Failure of Electricity Deregulation: History, Status and Needed Reforms,* FED. TRADE COMM'N (Mar. 2007), https://www.ftc.gov/sites/default/files/documents/public_events/Energy%20Markets%20in%20the%2021st%20Century:%20Competition%20Policy%20in%20Perspective/slocum_dereg.pdf.

24. *The Contrasting Policies of the FCC and FERC Regarding the Importance of Open Transmission Networks in Downstream Competitive Markets*, *supra* note 23, at 251; *see* Mark C. Christie, *Economic Regulation in the United States: The Constitutional Framework*, 40 U. RICH. L. REV. 3, 949, 968-69 (2006) (providing a discussion of the famous (at least among utility lawyers) U.S. Supreme Court opinion in *Duquesne Light Co. v. Barasch*, 488 U.S. 299 (1989) which arose out of this era and involved denial of cost recovery through rate base of the pre-construction costs for proposed but never completed nuclear power plants in Pennsylvania). *Duquesne Light* is probably the most recent time the Supreme Court evaluated those ubiquitous terms "just and reasonable" rates in the context of a Takings Clause claim under the Fifth Amendment. *See generally* 488 U.S. 299.

should remain regulated under the long-used cost-of-service model.[25] By the 1990s, for a variety of reasons, including the development of highly efficient combined-cycle gas turbine generators, there was general agreement that generation was no longer a natural monopoly.[26] So deregulation advocates argued that generators should be subjected to a competitive marketplace and seek their revenues through efficient operation and economic dispatch, not from the guaranteed revenue stream provided in rate base.[27] In response, states passing deregulation laws generally required the incumbent utility's generation resources to give up the guaranteed revenues that came from including generation assets in rate base. Instead, generation assets were required to seek revenues in newly-established RTO power markets, where they would compete with independent power producers (a/k/a "merchant generators"). According to the theorists, the most efficient generators would be winners in this competition for revenues, whether utility-owned or independent. The inefficient generators, denied guaranteed funding from rate basing, would be the losers and be forced to retire. All risk would be shifted from consumers to investors, or so the theory went.

FERC was no passive bystander in the deregulation movement; on the contrary, arguably FERC launched it with Order No. 888,[28] which required all jurisdictional public utilities to make their transmission assets available for interconnection and use by generators without regard to whether generators were utility-owned or independent. While Order No. 888 was within FERC's jurisdiction and consistent with a history of promoting competition,[29] there were undeniable tradeoffs. It created enormous pressure on states to deregulate. Generators in one state, both merchant and utility-owned, could now use their access to interstate transmission to undercut another state's regulated utilities which owned rate-based units *that customers had to pay for whether they dispatched or not*. This new reality created by Order No. 888 undermined both state regulators' authority over

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25. *Competition and Access to the Bottleneck: The Scope of Contract Carrier Regulation under the Federal Power and Natural Gas Acts*, *supra* note 23, at 8 ("the transmission of electric power is generally acknowledged to possess natural monopoly characteristics") (citing James Meek, *Concentration in the Electric Power Industry: The Impact of Antitrust Policy*, 72 COLUM. L. REV. 64 (1972)). There remains debate to the present day whether transmission, which includes both regional and local elements, is a natural monopoly. This article takes no position on that issue.

26. Kelliher, *supra* note 23, at 5-6.

27. "Rate base" is a term from cost-of-service regulation. Load-serving utilities are allowed to put assets (distribution, transmission and generation) into "rate base" and then recover in rates paid by customers depreciation costs over the lives of the assets, as well as a profit on the value of the assets in the form of return on equity, referred to in shorthand as "ROE." The setting of ROE is often the most important and contentious issue in a rate case.

28. Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services. by Pub. Utils.; Recovery of Stranded Costs by Pub. Utils. & Transmitting Utils.*; 75 FERC ¶ 61,080 (1999) ; *order on reh'g*; 78 FERC ¶ 61,220 (Order No. 888-A);, *order on reh'g*; 81 FERC ¶ 61,248 (1997) (Order No. 888-B); , *order on reh'g*,; 82 FERC ¶ 61,046 (1998) (Order No. 888-C), *aff'd in relevant part sub nom.;* Transmission Access Pol'y Study Grp. v. FERC, 225 F.3d 667 (D.C. Cir. 2000), *aff'd sub nom.;* New York v. FERC, 535 U.S. 1 (2002).

29. *Competition and Access to the Bottleneck: The Scope of Contract Carrier Regulation under the Federal Power and Natural Gas Acts*, *supra* note 23, at 3*; see also* Kelliher, *supra* note 23, at 1.

their own state utilities' resource planning and their ability to seek the optimal balance between generation and transmission costs.[30]

FERC then pushed way beyond Order No. 888. In the much more intrusive Order No. 2000, issued in 1999,[31] FERC created modern RTOs and shifted the deregulation movement into overdrive. Order No. 2000 made it crystal clear that FERC wanted *all* state-regulated public utilities to join federally-regulated RTOs.[32] This new goal expanded from ensuring open access to transmission assets to transferring effective control over those assets to the RTOs.[33] Just as significantly, pushing all utilities into RTOs meant that the transmission *planning function* itself was removed from the state-regulated public utilities and thus simultaneously removed from oversight by state regulators.

Transferring responsibility for transmission planning to the RTOs, even in states in which utilities remained vertically integrated, made it far more difficult, if not impossible, for state regulators to oversee effectively and comprehensively their state utilities' planning and construction of transmission, distribution and generation facilities, known as integrated resource planning, or "IRP." Overseeing the IRP process had long been one of the states' most effective tools for ensuring just and reasonable *retail* rates and reliable service, the two chief goals of state utility regulation. The IRP process enabled state regulators to balance the need for one type of proposed resource, be it generation, transmission, distributed energy or demand-side, against other alternatives, potentially of lower cost.[34]

In addition to taking over the transmission planning function from the utilities and their state regulators, the RTOs created under Order No. 2000 were charged with operating the regional power markets that were integral to deregulation and which would use single-clearing price mechanisms.[35]

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30. Slocum, *supra* note 23 at 3-4 ("Reliable planning and operation of a bulk supply system requires full coordination between generation and transmission and this functional separation made coordination much more difficult . . ."). Another one of the legacies of Order No. 888 has received much less attention but may have affected consumer costs significantly. The unbundling of transmission assets from distribution and generation meant that most rate regulation of transmission costs was transferred from state regulatory authorities to FERC, which offered transmission owners the formula-rate recovery mechanism. Formula rates are procedurally much more attractive to the transmission owner, and often much more generous than most state rate recovery mechanisms, in which the utility bears the burden of proving that costs are reasonable and prudent. The consequences of this transfer of rate authority to FERC and its impact on transmission costs to consumers are not the subject of this article, but they deserve one.

31. Order No. 2000, *supra* note 2.

32. *Id.*

33. *Id.* Order No. 2000 said its goal was "for *all transmission-owning entities in the Nation*, including non-public utility entities, to place their transmission facilities *under the control of the appropriate RTOs*." *Id.*

34. McNamee, *supra* note 5 ("In traditionally regulated markets, investor-owned utilities submit detailed integrated-resource plans that explain how they will meet future electric needs through a mix of generation resources.").

35. *Wholesale Electricity Markets and Regional Transmission Organizations*, AM. PUB. POWER ASS'N, https://www.publicpower.org/policy/wholesale-electricity-markets-and-regional-transmission-organizations.

While Order No. 2000 clearly intended that all public utilities would join the new RTOs, its text was not explicitly mandatory.[36] Many state-regulated utilities in the Southeast and West resisted doing so. In response, just a few years after Order No. 2000, FERC proposed *mandatory* RTO membership for *all* state-regulated public utilities, in its misbegotten Standard Market Design proposal.[37] After sparking a firestorm of opposition in Congress and from state officials, this proposal crashed and burned.[38] It was perceived – accurately -- as a glaring and ill-considered example of federal hubris and encroachment on the states' core retail-rate regulatory authorities, which are essential to regulation in the public interest.

Standard Market Design was "the bridge too far" that reversed the momentum of deregulation. Most states that deregulated did so before 2005, with various forms being adopted. Some early adopters went as far as full retail choice in which retail customers could choose among different, allegedly competitive, retail power marketers, and load-serving utilities were required to divest their generating assets.[39] Other states retained the monopoly model for retail sales to end-user customers but required their incumbent load-serving utilities to obtain power and capacity in RTO markets.[40] Some others reversed course before full retail choice was implemented and returned to the vertically-integrated, cost-of-service model, albeit within an RTO, with utilities still owning generation assets.[41]

As both the history of Order No. 2000 and the Standard Market Design proposal demonstrate, participation by utilities in RTOs was an integral part of the deregulation agenda and serves as a rough proxy for whether a state deregulated, at least in some form or degree. Deregulation was always about much more than whether a state's load-serving utilities shopped for power supply in power markets, but in those markets the use of SCP mechanisms has always been a key feature.

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36. *Electricity Markets – 101*, NAT'L GOVERNORS ASS'N, https://www.nga.org/electricity-markets/#:~:text=FERC%20Order%202000%20encouraged%20utilities,is%20owned%20by%20non%2Dutilities.

37. Request for comments, *Remedying Undue Discrimination through Open Access Transmission Service and Standard Electricity Market Design*, Notice of Proposed Rulemaking, FERC Stats. & Regs. ¶ 32,563 (2002), 67 Fed. Reg. 76,122 (2002).

38. Order terminating proceeding, *Remedying Undue Discrimination through Open Access Transmission Service and Standard Electricity Market Design*, 112 FERC ¶ 61,073 (2005). Mandatory RTO membership was proposed by a Commission under a chairman appointed by President George W. Bush, so FERC's role in pushing its regulatory reach too far, from the ill-conceived federal overreach in Order No. 2000 during the Clinton administration into the even more sweeping Standard Market Design proposal during the second Bush administration, was certainly bipartisan.

39. FED. TRADE COMM'N, COMPETITION AND CONSUMER PROTECTION PERSPECTIVES ON ELECTRIC POWER REGULATORY REFORM: FOCUS ON RETAIL COMPETITION (2001), https://www.ftc.gov/sites/default/files/documents/reports/competition-and-consumer-protection-perspectives-electric-power-regulatory-reform-focus-retail/electricityreport.pdf; *see also* Slocum, *supra* note 23; *see also* Borenstein & Bushnell, *infra* note 56.

40. *Id.*

41. Virginia provides such an example. 2007 Va. Acts ch.. 933 (April 4, 2007).

IV. DEREGULATION AND CONSUMER COSTS

Whether the deregulated models overall have, in practice, been better for consumers than the state-regulated, cost-of-service constructs may still be a matter of debate,[42] but there is persuasive evidence that deregulation provided no real cost savings to consumers; indeed, the empirical data available suggests that it actually has made power more costly for consumers in deregulated states.[43] Data from the U.S. Energy Information Administration and other sources has consistently showed a general pattern of *higher* residential electricity rates in most RTO states than in non-RTO states.[44] Since RTO participation was integral to deregulation, comparing rates in RTO and non-RTO states provides relevant context to a reconsideration of the pricing mechanisms that are also part of deregulation's legacy.[45]

Further, the question whether deregulation itself has actually saved consumers money is obviously relevant to any reconsideration of SCP mechanisms, since deregulation was advocated as a way to reduce costs to consumers, as well as shifting risk to investors.[46]

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42. James Downing, *After a Quarter Century, Industry Experts Still Split on Restructuring*, RTO INSIDER, (Jan. 17, 2023), https://www.rtoinsider.com/articles/31446-after-quarter-century-industry-experts-split-restructuring.

43. Alexander McKay & Ignacia Mercadal, *Deregulation, Market Power, and Prices: Evidence from the Electricity Sector*, MIT CTR. FOR ENERGY AND ENV'T POL'Y RES. (Apr. 2022), https://ceepr.mit.edu/workingpaper/deregulation-market-power-and-prices-evidence-from-the-electricity-sector/ ("We find that the increase in markups dominates despite modest efficiency gains, leading to *higher consumer prices and lower consumer welfare* [from deregulation].") (emphasis added); *see* Penn, Ivan, *Why Are Energy Prices So High? Some Experts Blame Deregulation*, N.Y. TIMES, (Jan. 4, 2023), https://www.nytimes.com/2023/01/04/business/energy-environment/electricity-deregulation-energy-markets.html ("Average retail electricity costs in the 35 states that have partly or entirely broken apart the generation, transmission and retail distribution of energy into separate businesses *have risen faster than rates in the 15 states that have not deregulated*. . . . That difference has persisted for much of the last two decades or so. . . . On average, *residents living in a deregulated market pay $40 more per month for electricity* than those in the states that let individual utilities control most or all parts of the grid. *Deregulated areas have had higher prices as far back as 1998*." (emphases added)); *see also* Scott Patterson & Tom McGinty, *Deregulation Aimed to Lower Home-Power Bills - For Many, It Didn't*, WALL STREET J. (Mar. 8, 2021), https://www.wsj.com/articles/electricity-deregulation-utility-retail-energy-bills-11615213623 ("Retail energy companies compete with local utilities to give consumers more choice. *But in nearly every state where they operate, retailers have charged more than regulated incumbents, a Wall Street Journal analysis found*.") (emphasis added)); Slocum, *supra* note 23, at 5-6. While not the subject of this article, one reason deregulation may have provided no cost savings to consumers is because many states already had relatively low rates under their traditional cost-of-service models, so there was nothing for deregulation to "fix." And it may have increased costs for consumers in deregulated states because by removing authority over transmission planning from states to RTOs, state regulators could no longer conduct integrated resource planning that balanced the costs of generation, transmission and other resources and sought the most cost-effective mix.

44. *State Electricity Profiles, Data for 2021*, U.S. ENERGY INFO. ADMIN. (Nov. 10, 2022) https://www.eia.gov/electricity/state/unitedstates/.; *see* Robert Mullin & James Downing, *A 'Deregulation' Debate by the Numbers*, RTO INSIDER (Jan. 16, 2023), https://www.rtoinsider.com/articles/31452-a-deregulation-debate-by-the-numbers ("McCullough contends that prices in RTO areas can be more sensitive to [price spikes] because RTOs rely on the single market clearing price mechanism to set prices, as opposed to the 'price-as-bid' nature of the traditional utility model."). *See* Slocum, *supra* note 23, at 5-6.

45. Downing, *supra* note 42 ("RTOs were created to lower costs to end-use consumers but have failed to do so, said Public Citizen's Energy Program Director Tyson Slocum.").

46. The author was a fact witness to such claims, serving as the director of policy for the governor of Virginia in the mid-1990s when deregulation was being promoted in Virginia as a way to reduce power costs,

V. DEREGULATION AND RELIABILITY

Not only was deregulation supposed to save consumers money, it was supposed to promote reliability. So it is also pertinent to ask whether RTO markets, especially the multi-state capacity markets, have been successful in ensuring a sufficient supply of the power necessary to sustain reliability.

The experience of ERCOT[47] – the purest example of a market approach to reliability through use of SCP scarcity pricing -- during Winter Storm Uri[48] should disabuse anyone but the most committed theorist of the belief that a pure market approach will be effective in ensuring reliability during extreme weather and unanticipated demand spikes.[49] Winter Storm Uri triggered controlled outages affecting more than four million customers, leaving many customers in Texas without power for days as power supplies were inadequate despite scarcity pricing.[50] Nor should ERCOT's market design be seen as a problem unique to Texas. Similar problems with the threat of critical supply shortages are growing in all the FERC-regulated RTOs as well, including several with capacity markets.[51] In these FERC-regulated markets, market design and the use of single-clearing price mechanisms cannot be summarily excluded from the discussion about the growing threat of supply shortfalls.

Another facet of the reliability question that should be examined is the so-called "missing money" problem.[52] For one thing was certain about deregulation and the move to RTOs and RTO markets. All the states that did adopt some form of it, as well as the RTOs they joined, faced one unavoidable question when it

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especially for the large industrial customers who were among the most vocal advocates. He began his service a few years later as a member of the Virginia State Corporation Commission, the state utility regulator, shortly after Order No. 2000 had established RTOs. FERC's Standard Market Design, which mandated RTO participation, was still pending when he sat on his first major utility case, to decide whether to allow Virginia's largest utility, Dominion Virginia Power, to enter the regional RTO, PJM Interconnection. *In the matter concerning the application of Virginia Electric and Power Company d/b/a Dominion Virginia Power for approval of a plan to transfer functional and operational control of certain transmission facilities to a regional transmission entity*, COMMONWEALTH OF VA. STATE CORP. COMM'N: EX PARTE, Case No. PUE-2000-00551 (Nov. 10, 2004). On deregulation advocates' promises of reduced consumers costs and shifting of risks, see Slocum, *supra* note 23, *supra* note 45, and Borenstein & Bushnell, *infra* note 56.

47. *About ERCOT*, ERCOT, *https://www.ercot.com/about.* Electric Reliability Council of Texas (ERCOT) is the ISO for most of Texas in terms of both load (roughly 90%) and geographic footprint. *Id.*

48. *Winter Storm Uri Spread Snow, Damaging Ice from Coast to Coast, Including the Deep South*, WEATHER CHANNEL (Feb. 16, 2021), https://weather.com/safety/winter/news/2021-02-14-winter-storm-uri-south-midwest-northeast-snow-ice.

49. McNamee, *supra* note 5 ("[A] big disconnect in the electric markets is that no one has an obligation to serve customers.").

50. *Id.*

51. NERC, 2022 LONG-TERM RELIABILITY ASSESSMENT (2022), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2022.pdf [hereinafter NERC LTRA 2022].

52. Murty P. Bhavaraju et al., *PJM Reliability Pricing Model - A Summary and Dynamic Analysis*, IEEE XPLORE (June 2007), https://ieeexplore.ieee.org/document/4275491 ("[S]ince the peaking generation needed to meet the adequacy criterion will not receive enough revenue from the energy market to justify investments, other revenue streams are needed to ensure that they cover their fixed costs. *The gap between the net revenues and fixed cost of generation is referred to as 'Missing Money.'*" (emphasis added)).

came to reliability: *How do we make sure the lights stay on in this brave new world of competing generators with no guaranteed revenues?* That is, what about the "missing money?" With rate base revenues gone, there was an entirely justifiable fear that energy market revenues alone would not attract sufficient generation investment to keep the lights on at times of peak demand, a threat exacerbated by the adoption of price caps in energy markets in many deregulated states.

Only one deregulated state -- Texas with the ERCOT model -- decided to go the "full Monty" on deregulation, adopting retail choice and depending entirely on a real-time energy market with scarcity pricing to attract enough generation resources to keep the lights on.[53] Not being willing to gamble like Texas on an energy-only market construct, several other RTOs and deregulated states turned to something else.

VI. THE USE OF SCP MECHANISMS IN U.S. CAPACITY MARKETS

In the eastern RTOs – ISO New England Inc. (ISO-NE), New York Independent System Operator, Inc. (NYISO) and PJM Interconnection LLC (PJM) – several (though not all) states adopted a deregulated model in which their load-serving utilities got entirely out of the generation business and all generators were forced to compete in RTO markets.[54] In contrast to Texas, however, to deal with the "missing money" problem, administrative constructs called "capacity markets" were created.[55] If the unavoidable question of deregulation was *how do we keep the lights on when generators no longer have dependable revenues from rate basing,* it turned out the answer in these RTOs was: *We will continue to give them dependable revenues called "capacity payments."* The creation of these markets necessarily conceded that investors *must* have certainty as to future revenues – and specifically that RTO energy market revenues alone are not enough to encourage investment in capital-intensive generation. The creation of these markets also destroys any argument that deregulation was all about shifting investment risk for generation assets from consumers to investors.[56] It never was, certainly not where capacity markets were established to provide the "missing money" to investors.

PJM describes its own capacity market this way:

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53. After the crucible of Winter Storm Uri, Texas is considering a major redesign of its markets to attempt to improve their reliability performance through payments to generators outside of the energy market. Naureen S. Malik & Mark Chediak, *Texas Regulator Backs Plan to Pay Power Plants to Bolster Grid*, FINANCIAL POST, (Jan. 19, 2023), https://financialpost.com/pmn/business-pmn/texas-regulator-wants-to-pay-power-plants-to-help-avoid-deadly-blackouts ("Texas regulators are throwing their support behind a plan to pay electric plants to be on standby to provide backup electricity to the state's grid to help avoid a repeat of the deadly blackouts during a 2021 winter storm. . . . Previous attempts to start similar programs, called *capacity markets*, in Texas have been defeated in the last decade.") (emphasis added).

54. Slocum, *supra* note 23 at 2-5; *see also* Borenstein & Bushnell, *infra* note 56.

55. *PJM Interconnection, LLC*, 117 FERC ¶ 61,331 at PP 1-2 (2006) (approving PJM's capacity market construct).

56. Severin Borenstein & James Bushnell, *The U.S. Electricity Industry After 20 Years of Restructuring* (Nat'l Bureau of Econ. Rsch., Working Paper No. 21113, 2015) ("*We argue that the greatest political motivation for restructuring was rent shifting, not efficiency improvements*, and that this explanation is supported by observed waxing and waning of political enthusiasm for electricity reform.") (emphasis added).

"The essential elements of the capacity market are:

- Procurement of capacity three years before it is needed through a competitive auction
- Locational pricing for capacity that varies to reflect limitations on the transmission system
- A variable resource requirement curve, which is the demand formula used to set the price paid to market participants for capacity and the amount of capacity

Capacity market participants offer power supply resources into the market that provide supply or reduce demand. These resources include new and existing generators, upgrades for existing generators, demand response (consumers reducing electricity use in exchange for payment), energy efficiency and transmission upgrades. When a participant offers these resources into the market, *that participant is committed to increase supply or reduce demand on the PJM system by the amount they offered, three years in the future*."[57]

If there are insufficient offers on the supply side – in other words, if not enough capacity is offered to meet the administratively set demand curve -- then all sell offers theoretically could even reflect a price based on a constructed value (Cost of New Entry or CONE) inflated by a subjective multiplier.[58] The resulting price would purportedly represent the scarcity price that is supposed to bring new supply rapidly into the market. This method is the SCP mechanism on steroids, paying suppliers not just the highest clearing price but an administratively set price potentially higher even than the price of the highest offer.

While there is variation across the capacity market constructs used in RTOs, all capacity markets use a single-clearing price mechanism and all pay winning sell offers the *highest* clearing price, even those offered at prices far below their actual costs due to subsidies.[59] None of the RTOs use a nodal price (such as LMP) as an element of the single-clearing price mechanism in their capacity markets.[60] They use instead zonal pricing based roughly on load-serving entity territories and data on transmission constraints, including the use of sub-zones within those territories.[61] Zonal SCP mechanisms may provide more granular price signals than an RTO-wide price, but nowhere near the granularity of LMP. So the arguments for the value of LMP's highly granular, nodal price signals, offered to justify its

57. *Capacity Market (RPM)*, PJM, https://learn.pjm.com/three-priorities/buying-and-selling-energy/capacity-markets (emphasis added); ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS, *supra* note 18, at 88. NYISO conducts three capacity auctions: six-month, monthly and spot. *Id.* at 83. ISO-NE conducts a three-year forward auction. *Id*. at 78. MISO conducts an annual *voluntary* resource auction. *Resource Adequacy*, MISO, https://www.misoenergy.org/planning/resource-adequacy/#t=10&p=0&s=FileName&sd=desc%3B; *see* ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS, *supra* note 18, at 94.

58. PJM Open Access Transmission Tariff, Attachment DD, § 5.10(a)(i), https://pjm.com/directory/merged-tariffs/oatt.pdf.

59. *Wholesale Electricity Markets and Regional Transmission Organizations*, AM. PUB. POWER ASS'N, https://www.publicpower.org/policy/wholesale-electricity-markets-and-regional-transmission-organizations-0#:~:text=Energy%20prices%20paid%20in%20these,meet%20the%20demand%20for%20power.

60. U.S. GOV'T ACCOUNTABILITY OFF., ELECTRICITY MARKETS: FOUR REGIONS USE CAPACITY MARKETS TO HELP ENSURE ADEQUATE RESOURCES, BUT FERC HAS NOT FULLY ASSESSED THEIR PERFORMANCE (2017), https://www.gao.gov/assets/gao-18-131.pdf.

61. *Id.* at 15-22.

use in real-time and day-ahead markets, simply do not apply as a defense of capacity markets.

One justification for capacity payments, however, does make sense. Power markets, unlike real markets, cannot tolerate shortages while waiting for suppliers to respond to price signals and produce more supply to meet demand. *Contra* Texas, we cannot run the risk of waiting to see if scarcity pricing alone in energy markets is incentive enough to balance power demand with sufficient power supply during times of peak demand and tight supply.[62]

Not willing to take the chance of depending on either energy or capacity markets for resource adequacy, many states, even in RTOs, remain vertically-integrated and continue to allow their load-serving utilities to keep generation resources in rate base or procure power through bilateral contracts. In MISO, the capacity market is only residual and most MISO states remain vertically integrated with generation-owning utilities. SPP,[63] in which all states remain vertically integrated, does not operate a capacity market at all, nor does the California Independent System Operator (CAISO). And, of course, many states in the Southeast, Pacific Northwest and Rocky Mountain regions did not deregulate at all, nor join RTOs, much less depend on capacity markets for resource adequacy.

In practice, capacity markets do not procure physical electrical power, but rather a future *pledge* to deliver power when needed to meet a *predicted* demand peak at emergency times.[64] Both the resources the RTO deems available to deliver power at the future emergency point in time, as well as the predicted demand at that future point in time, are unavoidably speculative. If actual demand at the future point is significantly higher than the prediction, a supply shortfall and outages will occur, the worst outcome. If actual demand is significantly lower, customers could be said to have paid too much. Those operating the capacity markets are speculating on future supply and demand just as integrated resource planners in vertically-integrated utilities are speculating. *Both are engaging in an administrative planning exercise*.

So, let's not pretend capacity markets, with their administratively set demand curves and scarcity prices, are true markets that are more efficient at predicting the future because of the Hayekian collective intelligence of the marketplace. They are just another way to transfer money from consumers to generation investors to try to ensure sufficient power supply in the future. Not that there's anything wrong with that *in concept*. If Americans are not willing to live with regular power supply shortages – and we are not – then it is necessary to pay in advance for resources to make sure they are there whenever needed, just like buying an insurance policy

62. Naureen S. Malik & Mark Chediak, *Texas Regulator Wants to Pay Power Plants to Help Avoid Deadly Blackouts*, BLOOMBERG NEWS, (Jan. 19, 2023, 4:46 PM), https://www.bloomberg.com/news/articles/2023-01-19/texas-regulator-backs-plan-to-pay-power-plants-to-bolster-grid#xj4y7vzkg. Even Texas now appears to be moving away from that approach, although at this writing state elected leaders had not taken final action on such proposals.

63. *About Us*, SW. POWER POOL, INC., https://www.spp.org/about-us/.

64. *Capacity Market (RPM)*, *supra* note 57 ("Capacity represents a commitment of resources *to deliver when needed*, *particularly in case of a grid emergency*." (emphasis added)).

that may never be used. Just don't pretend, however, that what's at work in capacity markets is Adam Smith's invisible hand efficiently allocating capital through a single-clearing price mechanism.

And that raises the following question: How can this administrative pricing mechanism used in capacity markets -- with the complexities and subjectivity of an administratively set demand curve, administratively set local deliverability areas used to calculate zonal prices to load, administrative determination of CONE, administrative judgments about effective load carrying capabilities, offer caps, *etc*. -- possibly be described as the "market" alternative to the "regulated" construct of paying for needed generation through rate base, or purchasing needed power through bilateral contracts? To the honest observer RTO capacity markets and state IRP processes are *both* planning constructs, just in different forms. This article suggests that most state IRP processes may be far better suited to plan comprehensively, to manage the risks associated with different types of generation, to incorporate demand-side resources, and to balance state policies promoting renewables with the core goals of delivering reliability and controlling consumer costs than RTO capacity markets are.

VII. DO SINGLE-CLEARING PRICE THEORIES FIT THE PRESENT-DAY REALITIES OF RTO POWER MARKETS?

To consider whether the theories offered in support of SCP mechanisms still apply, return to Justice Kagan's elegant description in *FERC v. EPSA* of how SCP works in U.S. power markets:

> So, for example, suppose that at 9 a.m. on August 15 four plants serving Washington, D. C. can each produce some amount of electricity for, respectively, $10/unit, $20/unit, $30/unit, and $40/unit. And suppose that LSEs' demand at that time and place is met after the operator accepts the three cheapest bids. The first three generators would then all receive $30/unit. That amount is (think back to Econ 101) the *marginal* cost—i.e., the added cost of meeting another unit of demand—*which is the price an efficient market would produce*.[65]

As Justice Kagan remembered from her Econ 101 class, the *marginal cost would be the price an efficient market would produce.* That, then, is the very foundation of the theory for using a single-clearing price mechanism, that the *marginal* cost is the price an *efficient market* would produce. The entire edifice of the SCP mechanism is based on this textbook theory of efficient markets.

But what if RTO markets are *not* efficient markets? In fact, as discussed above, what if they are not even markets at all? If the theory justifying the use of single-clearing price mechanisms is contrary to reality, savvy bettors know that in the clash between theory and reality, bet on reality to win. So, let's explore the theories versus the realities of the RTO markets in which single-clearing price mechanisms are being used.

The first theory, as Justice Kagan posited, is that in RTO markets competition is taking place on a level playing field *at the margin*, with generators competing on their *marginal* costs of production.[66] This theory comes closest to reality in the

65. *Elec. Power Supply Ass'n*, 577 U.S. at 268 (emphases added).

66. *Id.*

real-time markets, which are supposed to be agnostic as to the source of the power and which use the granular LMP mechanism to set prices at a nodal level every five minutes. Yet even in real-time energy markets the efficient-market theory is flawed, since some resources are almost always going to clear both because they effectively have *no* marginal costs (although significant upfront capital costs)[67] as well as heavy federal and state subsidies that may allow them to offer at a price of zero or even below. Both these factors give renewables a significant advantage over competitors that have significant marginal costs (but may have lower capital costs).[68]

Typically, the marginal cost for dispatchable[69] generation consists largely of the cost of fuel. But because several common types of dispatchable "baseload" generation, such as combined-cycle gas, nuclear[70] and coal, run most efficiently on a continuous basis for long periods, these generators are more cost-effective and therefore more competitive when priced on an average-cost basis, not on marginal costs. By contrast, intermittent resources,[71] including wind and solar, have no fuel costs at all, an overwhelming advantage when RTO markets determine winners purely on the short-term marginal cost of production.

This reality means that when RTO markets clear based on marginal costs, generators with virtually no marginal costs and subsidies that enable offers at zero

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67. Michael Milligan et al., *Marginal Cost Pricing in a World without Perfect Competition: Implications for Electricity Markets with High Shares of Low Marginal Cost Resources*, NAT'L RENEWABLE ENERGY LAB'Y 27 (2017), https://www.nrel.gov/docs/fy18osti/69076.pdf ("[Wind and solar] generation resources have high capital costs with near-zero marginal costs because of the lack of fuel costs.").

68. Clark & Duane, *supra* note 5, at 3-6.

69. Dispatchable generation is on-demand generation that (i) is not weather-dependent, (ii) can be scheduled with reasonable certainty, and (iii) can run for extended periods. *Energy Education: Dispatchable Sources of Electricity*, UNIV. OF CALGARY, https://energyeducation.ca/encyclopedia/Dispatchable_source_of_electricity#:~:text=A%20dispatchable%20source%20of%20electricity,the%20electrical%20grid%20on%20demand. Dispatchable generators are not impervious to weather extremes – Arctic weather can impact natural gas supply and degrade the performance of gas generators, as happened during both Winter Storms Uri in 2021 and Elliott in 2022– but dispatchable generators are not literally dependent on certain weather conditions to produce power, as intermittent resources are. *Infra* note 71.

70. Nuclear units have extraordinarily high capital costs but are designed to run continuously for months and refuel on a schedule independent of each dispatch. *U.S. nuclear capacity outages were 35% higher in summer 2020 than 2019*, U.S. ENERGY INFO. ADMIN. (Sept. 18, 2020), https://www.eia.gov/todayinenergy/detail.php?id=45176. "A planned nuclear generation outage is usually scheduled to coincide with a plant's refueling cycle. U.S. nuclear power plants typically refuel every 18 to 24 months . . . ." *Id*.

71. Intermittent resources are dependent on specific weather conditions to produce power. *Intermittent Power Resources: Frequently Asked Questions*, NEW YORK ISO, https://www.nyiso.com/documents/20142/20259596/Intermittent-Power-Resources-FAQ.pdf/110f029a-2864-cf0d-9f64-54d2edc12913; *Energy Education: Dispatchable Sources of Electricity*, *supra* note 69. The wind must blow for wind generators to produce and the sun must shine for solar generators to produce, which means that intermittent power production rises and falls independently of, and without correlation to, the demand for power (a/k/a "load"). While weather can be *forecasted* with varying degrees of accuracy, weather cannot be *scheduled*, so weather-dependent generators cannot be scheduled with certainty beyond the period weather itself can be accurately forecasted – and, of course, even next-day weather forecasts can be wrong. Battery storage has the potential to change this engineering reality if or (hopefully) when long-duration batteries are developed that can store enough power to inject on demand hundreds of megawatts into the grid for several days at a time, not just a few hours, and at costs that are competitive with other resources.

or below start with a huge built-in advantage. The single-clearing price mechanism makes that advantage even more profitable, because these generators can offer in at zero or below with out-of-market subsidies, but then receive the highest clearing price anyway, set by the last generator that is necessary to meet the demand curve, often a high-cost gas combustion turbine "peaker." This dynamic leads to another serious problem with incentives in current RTO market design: Investment in dispatchable generation that can no longer compete against heavily-subsidized, no-marginal-cost competitors will dry up, because what investor wants to risk capital on a generation resource that will face a market pricing mechanism stacked against it? This means existing dispatchable units necessary to keep the lights on will retire early and few new ones will be planned, as the current interconnection queues in RTOs already reflect. These consequences threaten reliability, as the North American Electricity Reliability Corporation (NERC) and the RTOs themselves continue to warn us.[72]

A second theory offered to support the use of a single-clearing price mechanism is that it sends price signals that balance *both* supply and demand. Advocates describe the SCP mechanism of LMP as delivering efficiency *both* on the supply and the demand side and emphasize the importance of scarcity pricing as part of the utility specifically of LMP:

> The description of the real-time LMP model often simplifies to marginal-cost pricing, which then collapsed to the treatment of the marginal cost of generators. In part this derives from *assuming that demand was fixed*. But this descriptive convenience was never exactly correct, nor necessary. For example, when load reached the capacity of a given swath of generation, there would always be an additional price component that would reflect the scarcity of lower cost generation. That would include high load periods when *all the available generation capacity was in use*. *Then scarcity prices would be necessary to balance supply and demand.*[73]

This last passage is particularly revealing. The use of single-clearing price mechanisms – LMP in this reference -- in American power markets is not only about giving price signals to generators and rewarding those with the lowest marginal costs. SCP is also justified as essential on the *demand* side, by using scarcity pricing to signal to load to *reduce demand* when supply is extremely short, in order to avoid the catastrophic imbalances between supply and demand experienced, for example, in ERCOT during Uri.

So, this argument for the single-clearing price mechanism is its value as a price signal *both to supply and demand*. But that seems suspect on both ends.

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72. Robert Walton, *Most of US electric grid faces risk of resource shortfall through 2027, NERC finds*," UTILITY DIVE (Dec. 16, 2022), https://www.utilitydive.com/news/nerc-grid-resource-adequacy-shortfall-reliability-assessment/638949/ ("NERC has been warning about the speed of the energy transition in recent years. 'Just to say it for the fourth or fifth time: Managing the pace of our generation retirements and our resource changes to ensure we have enough energy and essential services is an absolute necessity,' [NERC spokesman John] Moura said."); *see also* PJM, ENERGY TRANSITION IN PJM: RESOURCE RETIREMENTS, REPLACEMENTS AND RISKS (2023), https://www.pjm.com/-/media/library/reports-notices/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx (showing almost 40 gigawatts of largely dispatchable coal and gas generation resources predicted to retire in the next few years and insufficient replacement capacity in the queue).

73. Hogan, *supra* note 7 (emphases added).

For what if out-of-market subsidies have utterly distorted the price signals to supply resources, even occasionally distorting price signals and producing unfair outcomes among zero-marginal cost renewable resources themselves, such as state subsidies that may favor offshore wind to the detriment of onshore wind or solar?

And, on the demand side, the price signals to load are, *and always have been*, submerged in a *retail* power bill consisting of numerous non-by-passable charges, including separate, large and rapidly growing charges for distribution and transmission services, not to mention an array of out-of-market payments that appear as bill riders for zero-emission credits (ZECs), renewable energy credits (RECs), reliability-must-run (RMR) payments to generators, percentage of income wealth transfers, or any of the myriad other bill riders that special interests have lobbied state legislatures to authorize?[74]

Indeed, retail electric bills, even in fully deregulated states, have never reflected the nodal, five-minute changes in LMPs, and thus the claim that scarcity pricing based on LMPs is essential to balance supply and demand, especially at times when there is no more generation to dispatch (as in ERCOT during Uri), appears utterly disconnected from the reality of retail regulation at the state level. For it is state-level retail rate regulation that establishes the actual price signals that load – residential, commercial and industrial consumers – are effectively receiving. While some large industrial customers have responded to wholesale price changes through curtailment programs that pay them to reduce load, the vast majority of retail customers are not responsive to continual changes in wholesale costs since retail rates are fixed. On its face, that means retail residential customers cannot respond to wholesale power price changes. It is obvious then that retail customers, especially residential, are simply not going to respond to any single-clearing price mechanism in wholesale power markets by reducing their demand in five-minute or any other increments. That means depending on LMP or any single-clearing price mechanism in RTO markets to balance supply and demand in times of emergency is disconnected from reality.[75]

A third theory for the use of single-clearing price mechanisms in RTO markets holds that electricity is a *commodity*, so sellers can only compete on price and efficiency of production, not on differential attributes. This theory assumes all electrons are identical, so the price should be the same for all offers necessary to clear the supply stack. Following Justice Kagan's efficient-market theory of marginal costs, that means the highest clearing price should go to *all* sellers, even those who offered at zero or lower.

This theory also breaks down in the real world. RTO markets are not a forum for selling and buying physical power only on an agnostic basis, but rather, for

74. Clark & Duane, *supra* note 5, at 6-8.

75. The author has long been an advocate of variable or dynamic retail rate designs, such as time-of-use pricing, to send retail customers much more accurate price signals about the real-time cost of their power, but those retail rate design issues are matters of state regulatory authority, not federally-regulated RTO wholesale markets. Further, for time-of-use rate designs to be effective they require the wide deployment of costly advanced metering infrastructure, known as "smart meters." And such rate designs require a major effort to re-educate customers who for decades have been used to rates that are the same whenever power is being consumed.

buying and selling various packages of services -- real-time power, day-ahead financial hedging, financial transmission rights, ancillary services, future capacity deliverability. Indeed, RTO markets themselves have long undercut this commodity theory of electrical power through the use of devices such as "uplift" (a form of supplemental, out-of-market payment for certain necessary attributes)[76] and extended load carrying capability (ELCC) criteria, which adjust the accredited value of resources offered in capacity markets based on their assumed ability to perform at peak or emergency times. So, any pricing model based on a theory of the fungibility of electrons has long been compromised by the variety and differentiated characteristics of the products traded in RTO markets.

Even more importantly, the *political* reality is that certain state and federal policies, which create the context in which RTO markets operate, no longer treat electricity as a commodity at all. On the contrary, certain policies now regard the *source* of the power as far more important than the *price* of the power. Again, history provides relevant context. When RTOs and their markets were set up under Order No. 2000, the states joining RTOs to participate in those markets – as well as Congress and FERC – all generally shared a goal of obtaining power from any generator that represented the most efficient and least cost to consumers.[77]

Over the past two decades, however, that expectation has changed radically. Roughly half of the states adopted mandatory renewable portfolio standards (RPS) that explicitly favor renewable generation resources, primarily wind and solar, over thermal resources such as coal and gas.[78] A mandatory RPS is typically characterized by a legal requirement that load-serving utilities in the state must procure and sell to their customers a minimum but continually increasing percentage of power from renewable resources.[79] Obviously, a state law that mandates the purchase of certain preferred generation resources, but not their competitors, is in direct conflict with the principle of markets agnostically choosing winners based on price and efficiency.[80]

Further, at the federal level, Congress has enacted a whole array of subsidies in the form of investment and production tax credits. The recently passed "Inflation Reduction Act of 2022" increased the monetary values and lengthened the time periods for using the various subsidies available to preferred competitors in

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76. Clark & Duane, *supra* note 5, at 3.

77. For example, the Energy Policy Act of 2005 provided a definition of the policy goal of "economic dispatch" as "the operation of generation facilities to produce energy at the *lowest cost to reliably serve consumers*, recognizing any operational limits of generation and transmission facilities." Energy Policy Act, 42 U.S.C. § 16432(b) (2005) (emphasis added).

78. *State Renewable Portfolio Standards and Goals,* NAT'L CONF. STATE LEGISLATURES (Aug. 13, 2021), https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx. Several additional states have voluntary or aspirational goals; some others have repealed or allowed mandatory standards to expire. *Id.*

79. Nancy Radar & Scott Hempling, THE RENEWABLES PORTFOLIO STANDARD A PRACTICAL GUIDE, U.S. DEP'T OF ENERGY (2001), https://www.energy.gov/oe/articles/renewables-portfolio-standard-renewables-portfolio-standard.

80. Implementing a state RPS is actually more practicable in a vertically integrated, cost-of-service regulatory model, in which state regulators can direct their state's utilities to meet the RPS goals through an integrated resource planning process which balances all resources – transmission, generation, demand-side – while maintaining reliability.

RTO markets, such as wind and solar generators, but these subsidies were not made available to other competitors, such as gas and coal generators.[81] These federal subsidies effectively pick winners and losers in RTO markets.[82]

Thus continuing to use single-clearing price mechanisms in power markets produces a windfall (no pun intended) for the policy-preferred intermittent resources, which can offer at zero or below but receive the highest clearing price. So while the theory of RTO markets two decades ago may have born some resemblance to Justice Kagan's efficient-market theory from Econ 101, the reality today is that the wide array of state and federal subsidies has created a chasm between the RTO administrative constructs called "markets" and true markets in which competitors operate on a level playing field.

As a result, it is appropriate to consider whether single-clearing price mechanisms can still produce just and reasonable rates, which is, after all, what the Federal Power Act requires.[83] Do SCP mechanisms really produce benefits for consumers that are worth the costs? These questions are especially serious in capacity markets but should be examined in the context of all RTO markets. The deregulation tide that washed single-clearing price mechanisms into RTO markets has receded, and to paraphrase Warren Buffett, "when the tide goes out, you find out who's been swimming naked."[84]

So let's turn to a discussion of possible alternatives to single-clearing price mechanisms across different types of RTO markets.

VIII. ALTERNATIVES TO SINGLE-CLEARING PRICE MECHANISMS IN REAL-TIME AND DAY-AHEAD MARKETS

As noted above, real-time energy markets are what Justice Kagan was describing in her opinion in *FERC v. EPSA*. The arguments offered by Professor

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81. Nicholas James Irmen et al., *Inflation Reduction Act: Implications for Solar and Wind Tax Credit Equity Markets*, NAT'L L. REV. (Sept. 1, 2022), https://www.natlawreview.com/article/inflation-reduction-act-implications-solar-and-wind-tax-credit-equity-markets. *See* Adam Schurle et al., *The Inflation Reduction Act: Key Provisions Regarding the ITC and PTC,* RENEWABLE ENERGY OUTLOOK (Aug. 12, 2022), https://www.foley.com/en/insights/publications/2022/08/inflation-reduction-act-key-provisions-itc-ptc.

82. Katherine Nelson & Steve Piper, "Inflation Reduction Act-led decarbonization and the future of fossil generation," S&P GLOB. CAP. IQ (Dec. 19, 2022) ("The Inflation Reduction Act of 2022 creates tailwinds for green energy that put corresponding pressure on coal and natural gas generation. S&P Global Market Intelligence Power Forecast *predicts 117 GW of fossil generation will retire, with coal plants accounting for 70% of this capacity. Just as importantly, little new gas generation is forecast*, as storage undercuts gas capacity value and renewable generation undercuts gas in merit dispatch. . . . *Green energy incentivized by the act is poised to undercut project-financed merchant generation as we have understood it over the past 20 years*."). (emphases added)). It is deeply ironic given the history of federal energy policy since the Clinton administration, which has pushed competition in RTO markets as superior to state-regulated cost-of-service models, that these federal subsidies both undercut the competitiveness of RTO markets at the same time they make the state cost-of-service models much more attractive for fully utilizing these subsidies.

83. 16 U.S.C. § 824.

84. *Swimming Naked When the Tides Goes Out*, MONEY, (Apr. 2, 2009), https://money.com/swimming-naked-when-the-tide-goes-out/. The author has heard this quote also attributed to former Federal Reserve Board Chairman Paul Volcker, who served from 1979-1987. Buffett may have said it, but Volcker proved it when he relentlessly raised interest rates to squeeze out the double-digit inflation of the 1970s.

Hogan and others advocating the use of an SCP mechanism – specifically LMP – are most persuasive when applied to real-time energy markets.

Operated by all RTOs, they are the simplest constructs and most closely resemble real markets. Real-time energy markets enable the buying and selling of a *physical* product, the electrical power itself.[85] All use LMP as their single-clearing-price mechanism. In RTOs, however, only about 5% of load is scheduled in real-time markets; 95% is scheduled in day-ahead markets.[86]

Day-ahead markets, which are operated by most RTOs,[87] enable trading in a *financial* product, a contract setting a price on power to be delivered the next day.[88] The day-ahead markets also enable the system operators to schedule power generation commitments on an hourly basis, as well as ancillary services,[89] the day *before* what is called the "operating day." System operators use the real-time markets to balance supply with actual load.[90] Like real-time energy markets, RTO day-ahead markets use LMP as their single-clearing price mechanism. On the operating day, even if real-time LMP is higher than the agreed-upon day-ahead price, the buyer of the day-ahead contract pays no more than the contract price.

In the RTO real-time and day-ahead markets, one obvious alternative to any single-clearing price mechanism is simply to allow buyers and sellers to agree upon a mutually agreeable price for each transaction, just like in real markets. Consumers would benefit from paying the prices offered *below* the highest clearing price, instead of paying the highest clearing price to all sell offers, as happens now in those markets.

This simple pricing mechanism is already what takes place in bilateral trading markets, which operate in both RTO and non-RTO regions,[91] either in real-time trading or through power purchase agreements (PPAs). Willing buyers and willing sellers agree on the price for each transaction, as they have for decades. That is what power pools were originally established to do, to facilitate bilateral power trades between utilities, first to provide power to avoid outages during emergencies, then more generally to facilitate cost-savings by sharing reserve generating capacity.[92]

It is important to emphasize that bilateral trading can be just as competitive, even more so, than in market constructs, so it is wrong to assume that a bilateral

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85. ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS, *supra* note 18, at 127.

86. *Id.* at 62-64.

87. The California Independent System Operator (CAISO) does not currently operate a day-ahead market, but is developing one. *Initiative: Extended Day-Ahead Market (EDAM),* CAISO, https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/Extended-day-ahead-market.

88. ENERGY PRIMER: A HANDBOOK OF ENERGY MARKET BASICS, *supra* note 18, at 62-64.

89. Ancillary services are "functions performed by electric generating, transmission and system-control equipment to support the transmission of electric power from generating resources to load." *Id.* at 77. Ancillary services can include reserves that have different ramping time attributes, from a few minutes to as much as thirty minutes, and include spinning reserves, non-spinning reserves and supplemental reserves. *Id.* at 56-57, 88.

90. *Id.* at 1.

91. *Id.* at 58-59. It should be noted that some bilateral transactions in both RTOs and non-RTOs are based on cost-based, not market-based, rates.

92. *Id.* at 36-37.

trading system is somehow an abandonment of competition.[93] In both RTO and non-RTO states these transactions should still remain subject to FERC's duty (i) to protect consumers from exercises of market power, (ii) to grant or deny market-based rate authority and (iii) to punish bad actors who manipulate bilateral trading or engage in predatory pricing.

Nor should it be assumed that bilateral trading between utilities can only be conducted in the traditional and time-consuming way, such as by telephone calls. Bilateral trading systems are subject to continual improvements based on technology and can be set up to operate in real time, just as RTO markets do. For example, the Southeast Energy Exchange Market (SEEM) is already operating a real-time, bilateral, power trading market. This is a fully automated bilateral market operating on a computer algorithm that matches willing buyers and sellers every 15 minutes.[94] There are no transmission costs because only unused transmission capacity is used, so there is no "rate pancaking."[95] A willing buyer and a willing seller set the price for *each* transaction, using a "split the difference" pricing formula that automatically settles each transaction at the mid-point between the offer and bid. No SCP mechanism is used. Prices are localized to the buyer and seller. Price signals are transparent and available.[96]

Another alternative being considered in Europe is to bifurcate the market, establishing different clearing prices for low-marginal cost resources such as wind and solar, and another for gas.[97] This could solve the perceived problem with pay-as-offered, that low marginal cost sellers would simply game the market by offering at or near what they think the clearing price will be anyway, so consumers really save no money.[98]

Yet another option to consider could be some form of average pricing, so that the highest clearing price was not exclusively the price that is paid to all sell offers.

The point is not to advocate a specific alternative, but to ask whether any of these options -- pay as offered, average pricing, automated, real-time bilateral trading, or a market bifurcated between low and high marginal cost generators -- represent better pricing mechanisms than paying the highest clearing price to all

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93. Mullin & Downing, *supra* note 44 ("[Robert] McCullough . . . among the first to identify the manipulation that sparked the Western energy crisis of 2000-01 . . . has long been a vocal critic of RTOs and ISOs, which he refers to as 'administered' markets, compared with what he calls the 'competitive' bilateral wholesale markets that predominate in the West. 'Northwest power markets are large and competitive and low-price, but we don't have a central administrator to tell us what to do.'").

94. SE. ENERGY EXCH. MKT., https://southeastenergymarket.com/.

95. *Pancaking*, HARVARD ELEC. POLICY GRP., https://hepg.hks.harvard.edu/faq/pancaking ("Rate pancaking" means paying multiple charges to more than one utility to move electric power across multiple utility systems.).

96. *Regulatory Filings and Documents*, SE. ENERGY EXCH. MKT., https://southeastenergymarket.com/filings/.

97. India already operates bifurcated markets separating renewables from other generating resources. *See supra*, note 3.

98. *Action and measures on energy prices*, *supra* note 3 ("In the pay-as-bid model, producers (including cheap renewables) would simply bid at the price they expect the market to clear, not at zero or at their generation costs.").

sellers.[99] No one should prejudge the answers, but those are the types of questions that should be explored, without limitation, in a cautious and thorough reconsideration of pricing mechanisms in US real-time and day-ahead power markets.

IX. CAPACITY MARKETS AND ALTERNATIVES

"I've always viewed forward capacity markets as the original sin of market design."

– Professor William Hogan[100]

When one of the leading theorists of power-markets rate design pronounces capacity markets a sin, it is obviously time to ask whether capacity markets themselves are an experiment that is no longer working as intended, if it ever did, regardless of the pricing mechanism.

As noted above, U.S. capacity markets use a single-clearing price mechanism, but not LMP, so the arguments in favor of LMP's granularity do not apply.[101] Capacity markets do not enable the purchase and sale of physical power, but rather a *promise* to deliver power (or to reduce load, which promise does not represent a generating resource) at a *future* point in time to meet a predicted peak demand. The transactions involve essentially futures contracts. Price signals do not reflect real-time power sales, but only the trading in what Professor Hogan below calls "financial hedging contracts."[102]

Again, as briefly referenced above, the argument that all electrons are fungible, that power is a commodity, and therefore that all promises to deliver power in the future should be priced at the *highest* clearing price, simply evaporates in application to capacity markets. State policies mandating that utilities must purchase

99. At least one RTO implicitly acknowledged concerns with LMP and did try to develop an alternative. PJM discussed a proposal for something called an "Integer Relaxation for Electricity Market Clearing" mechanism. Clark & Duane, *supra* note 5, at 4-5. It ultimately went nowhere.

100. Sam Mintz, *NECA Panelists Talk Capacity Market, DERs*, RTO INSIDER (Dec. 14, 2022), https://www.rtoinsider.com/articles/31291-neca-panelists-talk-capacity-market-ders ("'I know it's politically embedded in the system . . . but *I don't think they're a solution to any real problem other than mailing checks to people,*' Hogan said." (emphasis added)).

101. Harvey and Hogan distinguish the use of LMP in American energy markets with the lack of its use in the UK and EU, which according to the authors use much less granular, and therefore less effective, SCP mechanisms. Harvey & Hogan, *supra* note 7, at 5, 15. Which may be true, but not necessarily dispositive of the question whether paying all offers the marginal price is appropriate. Regardless of the geographic scope of the "L" in Locational Marginal Pricing, it is the "M" in LMP that may be the problem, as it is in all single-clearing price mechanisms.

102. Hogan, *supra* note 7, at 23.

power *based on the type of generator* or other attributes, other forms of state subsidies, such as zero emissions credits (ZECs),[103] combined with lavish federal subsidies in the form of investment and production tax credits,[104] undercut any continuing claim that capacity markets are simply procuring the lowest-cost capacity on an agnostic basis. As one former FERC commissioner pungently put it, "Hundreds of billions in favored federal tax treatment and subsidies for renewable[s] . . . is more than a thumb on the scale of energy markets, it is a twelve-ton dump truck."[105] So what purpose is served by giving *all* sell offers the *highest* clearing price? If their promises of future deliverables are based on their *actual* costs, discounted for subsidies, why shouldn't each seller that clears simply get its offer price?

As a result of the "twelve-ton dump truck" on the scale, the large multi-state RTOs such as PJM now contain states with such widely divergent energy policies that trying to operate a credible capacity market on an RTO-wide basis increasingly appears to be a hopeless exercise, as the intense controversy among the states over PJM's most recent minimum offer price rule (MOPR) proposal demonstrates.[106]

Even the strongest advocates of the use of the single-clearing price mechanism of LMP in real-time and day-ahead markets are highly critical of the capacity market construct itself, regardless of the SCP pricing mechanism. As Professor Hogan puts it:

> The problems with forward capacity mechanisms and stimulating investment arise in part because *ensuring specific performance of physical capacity contracts is beyond the capability of our knowledge*. If we knew how to guarantee deliverability of specific generation determined years ahead in capacity auctions, we would not need organized markets to manage the complex conditions that arise in the real-time market.

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103. *NY Creates New Emissions Credit for Nuclear Plants*, MCDERMOTT, WILL & EMERY: ENERGY BUSINESS LAW (Sept. 20, 2016), https://www.energybusinesslaw.com/2016/09/articles/environmental/ny-creates-new-emissions-credit-for-nuclear-plants/) ("The ZEC, or zero-emissions credit, is the first emissions credit created exclusively for nuclear power . . . . The ZEC is the result of a highly politicized effort to support New York's struggling nuclear power plants."); *see Zero Emission Credits*, ILL. POWER AGENCY, https://www.ipa-energyrfp.com/zero-emission-credits/ (Illinois also legislated a ZEC subsidy.).

104. Irmen et al., *supra* note 81; Schurle et al., *supra* note 81. *See also* Nelson & Piper, *supra* note 82. This article acknowledges that the federal tax code and budget are riddled with various forms of tax and spending subsidies for a wide range of energy resources, depending on how one defines "subsidies," including some benefitting oil, natural gas and coal. ENV'T AND ENERGY STUDY INST., FOSSIL FUEL SUBSIDIES: A CLOSER LOOK AT TAX BREAKS AND SOCIETAL COSTS (2019), https://www.eesi.org/files/FactSheet_Fossil_Fuel_Subsidies_0719.pdf. Such subsidies do not have the specific and immediate impact on the operation of pricing mechanisms in RTO power markets, however, that the tax subsidies in the Inflation Reduction Act do.

105. Tony Clark, *Inflation Reduction Act adds fuel to RTO reform imperative, generator interconnection backlog*, UTILITY DIVE, (Nov. 8, 2022), https://www.utilitydive.com/news/inflation-reduction-act-ira-rto-interconnection-queue-ferc-tony-clark/635959/. Renewables advocates might argue that thermal resources such as coal and gas have also long received *implicit* subsidies by not being charged for negative externalities such as carbon emissions. The debate over quantifying externalities, which to be serious must consider all externalities, *both* negative and positive, is needed, but is not the subject of this article.

106. See, *e.g., Amended Joint Petition for Rehearing of the Pennsylvania Public Utility Commission and Public Utilities Commission of Ohio to the Commission's Failure to Issue an Order Accepting or Denying PJM's Filing Concerning Application of the Minimum Offer Price Rule*, FERC Docket No. ER21-2582-000 (Aug. 20, 2021).

> Recognizing that capacity mechanisms are in effect *financial hedging contracts* . . . would allow market reforms and the *gradual atrophy of the existing capacity markets*.[107]

Others have likened the continuous effort to "fix" capacity market constructs through seemingly perpetual tweaking and adjusting to an endless "whack-a-mole" game.[108]

So what are the alternatives to the use of SCP in capacity markets? Indeed, to the use of capacity markets at all?

First, it should be asked whether the pure economics "textbook solution" -- scarcity pricing alone -- should be considered an acceptable regulatory method of achieving resource adequacy.[109] "Scarcity pricing" is another term for "shortage pricing," but socially and economically Americans simply cannot and will not accept extended shortages in the power supply. Indeed, multi-day shortages lead to catastrophes such as Texas during Winter Storm Uri, during which skyrocketing scarcity prices did not lead to an immediate influx of power resources entering the market to restore power, but did produce horrific spikes in power bills for load-serving utilities and ultimately retail consumers.

What happened in Uri should not be dismissed as an outlier.[110] While extraordinary weather events can take down any power grid regardless of market design, often through wind or ice impacts on the wires grid, when the outages are caused by loss of power supply depending on scarcity pricing to restore supply quickly is a recipe for turning an already bad situation into a disaster.[111]

Winter Storm Uri illustrates an important lesson. To ensure that sufficient generating reserve capacity is available at all times of peak demand, in order to deliver the level of reliability Americans expect, generating capacity *must* be funded in advance and cannot depend solely on scarcity pricing.

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107. Hogan, *supra* note 7, at 23 (emphases added).

108. Delia Patterson & Harvey Reiter, FERC CHASING THE UNCATCHABLE: TRYING TO FIX MANDATORY CAPACITY MARKETS IS LIKE TRYING TO WIN AT WHACK-A-MOLE, STINSON, LLP (2016), https://www.lexology.com/library/detail.aspx?g=1017dff1-42c8-4b8f-ada1-6ce816a20fec ("FERC's efforts to get capacity markets "right" . . . have instead led to endless - and futile - tinkering. . . . It's time for FERC to start over, or at least regroup and reassess.").

109. Hogan, *supra* note 7, at 17 ("The Texas experience through 2020 reinforced the need for scarcity pricing and the analysis of the benefits. Prices were high during scarcity conditions, helped alleviate stress on the system, and were supporting new generation investment.").

110. *Id.* at 17-18 ("The exceptional emergency during February 2021 remains a subject of important further study and investigation as part of the regulatory review. However, the weather conditions were a one-in-fifty year event, so extreme and well outside the traditional one-in-ten year reliability standard that it is not clear than any electricity system design would have fared well.").

111. Variations on scarcity pricing, such as an operating reserve demand curve (ORDC), which is used by some RTOs (including ERCOT) to procure reserves needed for reliability, look very much like another way to provide the "missing money," serving a capacity market function by another name. *See generally* Raúl Bajo-Buenestado, *Operating reserve demand curve, scarcity pricing and intermittent generation: Lessons from the Texas ERCOT experience*, 149 ENERGY POL'Y 112,057 (2021) ("The basic idea underlying this mechanism is that generators that participate in the real-time market get paid not only the real-time (locational marginal) price, but also an "extra" price –called the ORDC price adder– if total reserves available in the market cross a lower threshold.").

Certainly, capacity markets are one option to pay generation resources to be available, but even assuming the continuance of capacity markets does not mean an unquestioning acceptance of the use of an SCP pricing mechanism in capacity markets. One possible alternative is instead to pay each winning seller the price it offers. Since RTO capacity markets are not using LMP specifically, the arguments for LMP in terms of the granularity of its price signals do not apply in defense of the less granular SCP mechanisms used in capacity markets. Adopting a "pay as offered" mechanism could cut costs to consumers substantially since consumers could get the benefit of the lower-priced offers from heavily subsidized resources such as wind and solar.

There are several other alternatives to the current pricing mechanisms in capacity markets, even to capacity markets themselves. Among them include (i) developing easier and more attractive methods for load-serving utilities in RTOs with capacity markets to self-supply outside of the capacity market, (ii) replacing forward capacity markets with near-term auctions that do not extend beyond the coming year or season,[112] (iii) using capacity markets only as a residual option, as in MISO,[113] or (iv) phasing out capacity markets entirely. Neither SPP -- an RTO -- nor the Western Power Pool's recently formed Western Resource Adequacy Program use capacity markets to achieve resource adequacy; rather, both use a construct that requires load-serving utilities either to build or purchase through bilateral contracts sufficient capacity to keep the lights on.[114]

In the broadest sense, states in the multi-state RTOs that are relying primarily on capacity markets for their utilities' resource adequacy should consider whether to reclaim their responsibility for resource adequacy, and if necessary, to amend their state's regulatory construct for utility regulation to enable such a reclamation of responsibility.

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112. Kate Winston, *US Forward Capacity Markets are a 'Terrible Idea' Should be replaced: Market Monitor*, S&P GLOB. COMMODITY INSIGHTS: MEGAWATT DAILY (Mar. 9, 2023), https://www.spglobal.com/commodityinsights/en/products-services/electric-power/megawatt-daily ("Forward capacity markets do not work, and key regions that have them should consider switching to a prompt capacity market that procures capacity for just the coming year or season . . . . 'Forward capacity markets are a terrible, terrible idea. They have always been a bad idea,' said David Patton, president of Potomac Economics [and independent market monitor for MISO and ISO-NE]").

113. In MISO, even though the capacity market is considered residual or voluntary, questions are being raised about whether that construct is working well and resource adequacy is becoming a major problem as more and more dispatchable units retire prematurely. Peter Behr & Jason Plautz, *Grid monitor warns of U.S. blackouts in 'sobering report'*, ENERGYWIRE (May 19, 2022), https://www.eenews.net/articles/grid-monitor-warns-of-u-s-blackouts-in-sobering-report/. "MISO officials have agreed with NERC's cautions about the strains on the region's power supplies. MISO is facing increased retirements of coal, natural gas and nuclear generation. . . ." *Id. See* Amanda Durish Cook, *MISO Stakeholders Debate Capacity Accreditation, RA*, RTO INSIDER (Mar. 5, 2023) https://www.rtoinsider.com/articles/31748-miso-stakeholders-debate-capacity-accreditation-ra ("[WEC Energy Group's Chris] Plante said the capacity market has evolved from its 'humble beginnings' . . . . MISO and stakeholders should reestablish what they want from their capacity market. . . .").

114. *See Southwest Power Pool*, 164 FERC ¶ 61,092 (2018); *see also Northwest Power Pool*, 182 FERC ¶ 61,063 (2023).

States have always had the authority to determine how to regulate their utilities; it is embedded in their inherent police powers.[115] Instead of depending on capacity markets, they could resume requiring each load-serving utility to obtain sufficient power capacity through a balanced mix of constructing new generation financed through rate base to ensure availability in emergencies, as well as procuring power through competitively-bid PPAs, a good way to meet state renewable power mandates while ensuring that necessary resources do not prematurely retire. States could require their utilities to conduct robust integrated resource planning that evaluates generation resources comprehensively, including those on the distribution grid, along with transmission and demand-side programs, to produce the optimal outcomes that provide consumers with reliable power at the least cost.

There is another compelling principle at issue here that is not unique to utility regulation: accountability in a democratic system. When elected state policy-makers and regulators are clearly responsible for ensuring that their state's load-serving utilities have adequate generation resources at reasonable costs, the people know whom to hold accountable when the lights go out or costs are unreasonable.

X. CONCLUSION

"This is the best bad idea we have . . . ."

– Bryan Cranston (playing the CIA deputy director in the movie Argo (2012)[116]

It is time to reconsider – carefully and cautiously – the use of single-clearing price mechanisms in RTO power markets, especially in capacity markets. Indeed, with regard to the latter, it is time to consider whether capacity markets themselves are capable of doing the job they are expected to do, regardless of pricing mechanism, or should be replaced with alternative means of achieving resource adequacy.

In so doing, it is important to recognize two key realities about the American power industry:

First, Americans will not tolerate the temporary shortages that occur regularly in every true competitive market. So, applying the textbook theories of market economics to the power grid that animated the deregulation movement of the late 1990s and early 2000s (and was cynically exploited by rent-seekers such as Enron and many others since), will not provide consumers with reliable power service at the *least* cost under applicable laws, the policy goal when regulating monopoly providers of a vital public service.

Second, given that the electric power industry remains to a significant extent a network industry and one with extremely high upfront capital costs, it will tend to produce sellers with market power.

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115. The history of this regulatory authority rooted in the states' inherent police powers is described in the landmark Supreme Court opinion in *Munn v. Illinois,* 94 U.S. 113, 124-28 (1877) and discussed in Christie, *supra* note 24, at 40:949, 954-56. Such inherent authority is, of course, subject to federal pre-emption where constitutional and exercised by Congress.

116. *ARGO* (Warner Bros. 2012).

Both of these features mean that the power industry should and will be heavily regulated. In choosing regulatory models, it is essential to be honest and admit up front *there is no perfect model of regulation.* All regulation attracts rent seekers and contains the threat of regulatory capture. The search is not for the perfect regulatory model; it does not exist. So, like the CIA deputy director in *Argo,* we are seeking the best bad regulatory option. Cost-of-service regulation of vertically-integrated utilities, the model of choice in most American states for most of the past century, and still widely used, undeniably has its many flaws, but it also has its positive attributes.[117] Now more than two decades after deregulation sought to replace state-regulated cost-of-service models with models using RTOs and their power markets that feature single-clearing price mechanisms, it is clear that there are major flaws in those regulatory models as well.

Honesty also requires admitting that these purportedly "deregulated" models are, in fact, just different regulatory constructs. It has always been a false dichotomy to pose the choice as "markets versus regulation," as deregulation advocates used to do and RTO markets advocates still do.[118] As one of history's most brilliant regulatory economists, Alfred Kahn, once said:

"The two principal institutions of social control in a private enterprise economy are competition and direct regulation. Rarely do we rely on either of these exclusively . . . . The proper object of search, in each instance, is the best possible mixture of the two."[119]

In a true market that's competitive, consumers and efficient sellers win and inefficient sellers lose. A competitive market regulates itself and the market participants don't set the rules. So, the regulator's job is not to regulate a competitive market for outcomes but rather to protect competition from rent-seekers and their lobbyists, and to avoid regulatory capture.

Administrative constructs, however, such as RTO markets, where rent-seeking market participants themselves, as well as other interest groups, play a major role in setting the market rules, are far more vulnerable to rent-seeking than truly competitive markets. Now when these constructs have delivered results that were demonstrably cheaper than power purchased through bilateral contracts or from units in rate base, consumers would have benefitted. This article does not deny that there may have been benefits to consumers at times from RTO markets, compared to alternative regulatory constructs, although one could argue just as persuasively that most cost savings to consumers in RTO markets since 2005 were really the result of the fracking revolution that drove natural gas prices down below $3 per MMBtu by 2021 and benefitted consumers just as much in cost-of-service models through lower costs recovered in fuel-factor and other rate mechanisms.

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117. Slocum, *supra* note 23, at 2 ("Although [the pre-restructuring state-regulated system] was often abused because of the enormous political power of the electric utilities and their ability to influence state policymakers, it was regarded as *the most reliable and affordable electric system in the world*.") (emphasis added).

118. Peter Eavis, *Clean Energy Quest Pits Google Against Utilities*, N.Y. TIMES (Dec. 20, 2022), https://www.nytimes.com/2022/12/20/business/google-clean-energy.html ("Google says its goals for carbon-free power are impeded by state-regulated utilities, particularly in the Southeast, that lack a competitive market.").

119. Kelliher, *supra* note 23, at 9 (quoting Kahn, *supra* note 17, at xiii).

And while consumers may have benefitted when these markets produced competitive results at a time of falling gas prices, all too often the special interests that did not get what they wanted from RTO markets went to the politicians in the various states and Congress and lobbied for subsidies, portfolio mandates and other forms of rents. It is hard to argue that RTOs have been more immune from the rent-seeking that too frequently takes place in state legislatures;[120] indeed, RTOs are also vulnerable to it, partly due to governance issues that are not the subject of this article.[121] One argument offered for deregulation at its beginning was that the iron discipline imposed by regional markets would block the rent-seeking inherent in the highly regulated state models. It has become clear, however, that deregulation only expanded the rent-seeking opportunities to the RTO constructs and created even more work for special-interest lobbyists pushing state legislatures and Congress to override or negate the competitive results the RTO markets did manage to produce.[122]

So it is now time for a thorough reconsideration of the pricing mechanisms used in all of our RTO power markets. FERC, as the creator and regulator of RTOs and their markets, should lead it. These pricing mechanisms are part of the legacy of deregulation, and a thorough reconsideration should logically examine whether the assumptions that underpinned deregulation are still valid, if they ever were. This reconsideration should begin with capacity markets and should not be afraid to take on the broader question of whether capacity markets can consistently obtain the power supply necessary to maintain reliability at just and reasonable rates, regardless of pricing mechanism.

While not advocating for any specific outcome, this article asserts that undertaking such a comprehensive reconsideration is both timely and compelling. And the focus should always be on the most important questions of all: whether the power industry's customers – residential, commercial and industrial – are really benefitting from these pricing mechanisms in power markets, or whether alternatives would deliver a more reliable power system at lower costs to consumers.

120. Slocum, *supra* note 23, at 4.

121. On the current problems with RTO governance, while the author may not agree with their ultimate recommendations, Clark and Duane again offer a penetrating insight from expertise and experience. *See* Vince Duane & Tony Clark, WHO OWNS THE RTO?: WHY RTO GOVERNANCE IS AN ACHILLES HEEL IN THE CLEAN GRID TRANSITION, WILKINSON, BARKER, KNAUER, LLP (2021), https://www.wbklaw.com/news/white-paper-who-owns-the-rto/.

122. Slocum, *supra* note 23, at 4; Borenstein & Bushnell, *supra* note 56.

HYDROGEN'S POTENTIAL ROLE IN LDCS' TRANSITION TO A LOW-CARBON FUTURE

Marcia Hook, Drake Hernandez, Duncan Grimm, Heidi Li[*]

Synopsis: Every day across the United States, local distribution companies (LDCs) deliver natural gas to millions of homes and businesses, allowing people to heat buildings and water, cook, operate cooling equipment, and meet other basic needs. Increasingly, however, LDCs face challenges from regulators, investors, consumers, and other stakeholders pushing for a transition to a lower-carbon future. Many LDCs find themselves grappling with an existential question: how should a business based on natural gas adapt and transition into a low-carbon future? This article explores what role hydrogen can play in an LDC's energy transition strategy. The numerous practical and legal challenges to integrating hydrogen into the LDC system and business model mean that hydrogen will not be a panacea for LDCs seeking to successfully transition into a low-carbon future. However, with appropriate study, planning, and action, LDCs can position hydrogen as a component of their energy transition strategies.

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I. INTRODUCTION

There can be no dispute that natural gas is currently indispensable to meeting basic needs of residential and commercial users across the United States. Approximately half the homes in the United States use natural gas for space and hot water heating.[1] Residential and commercial users of natural gas together represented roughly 26% of the United States' natural gas consumption in 2021.[2] In 2018, approximately 90% of this natural gas was delivered by LDCs.[3]

Yet the last few years have seen a historically unprecedented push by regulators, investors and consumers towards decarbonization, which has had direct implications for these LDCs. At the local level, dozens of cities have adopted bans on new natural gas hookups in residential and commercial buildings, including major cities such as Santa Monica and New York City.[4] State legislatures and regulators also have taken significant steps to transition away from the use of natural gas in residential and commercial buildings.[5] These steps include several state regulators initiating "gas transition" proceedings, Washington updating its State Energy Code to require builders to install electric heat pumps for space and water heating in most new commercial buildings and multifamily residences, and the California Air Resources Board voting to end the sale of gas furnaces and gas water heaters in its state by 2030.[6] At the national level, the U.S. Consumer Product Safety Commission announced in early 2023 that it intended to issue a Request for Information seeking the public's input on hazards associated with gas stoves.[7]

Given the concentration of such bans and other proceedings in certain states and the backlash against such initiatives, it might be tempting for some to discount the potential impacts of these legislative and regulatory initiatives on LDCs. After all, twenty states, representing 31% of U.S. residential and commercial gas use, have adopted laws prohibiting the adoption of local gas bans.[8] And, on April 17, 2023, the 9th Circuit struck down the City of Berkeley's gas ban, finding that it was preempted by the Energy Policy and Conservation Act, potentially portending a similar fate for similar measures adopted by other jurisdictions.[9] However, the pressure to decarbonize is not coming just from legislatures and regulators, but

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1. *Natural Gas Explained: Use of Natural Gas*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/natural-gas/use-of-natural-gas.php (last updated Nov. 16, 2022).

2. *Id.*

3. *Today in Energy,* U.S. ENERGY INFO. ADMIN. (Jul. 31, 2020), https://www.eia.gov/todayinenergy/detail.php?id=44577.

4. *See infra* section III.B (discussing "stretch" codes and other state and local government actions).

5. *Id.*

6. CAL. AIR RES. BD., 2022 STATE STRATEGY FOR THE STATE IMPLEMENTATION (2022), https://ww2.arb.ca.gov/sites/default/files/2022-08/2022_State_SIP_Strategy.pdf.

7. *Minutes of Commission Meeting, Decisional Matter: Fiscal Year 2023 Operating Plan*, UNITED STATES CONSUMER PROD. SAFETY COMM'N (Oct. 26, 2022), https://www.cpsc.gov/s3fs-public/Commission-Meeting-Minutes-FY-2023-Operating-Plan_0.pdf?VersionId=wiJw89I902pxZ_6C.Zz08whJ6l6.9fo5.

8. Tom DiChristopher & Anna Duquiatan, *States that outlaw gas bans account for 31% of US residential/commercial gas use,* S&P GLOB. MKT. INTEL. (Jun. 9, 2022), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/states-that-outlaw-gas-bans-account-for-31-of-us-residential-commercial-gas-use-70749584.

9. California Rest. Ass'n v. City of Berkeley, No. 21-16278, slip op. at 7 (9th Cir. 2023).

also from investors, companies, customers, and other stakeholders.[10] Nearly 40% of all Fortune Global 500 companies have set a net-zero target.[11] These pressures can affect any LDC, even where there is no concerted state legislative or regulatory action.

While a summary of the climate commitments and actions of all public and private actors in the U.S. that could impact LDCs is beyond the scope of this article, the snapshot provided above highlights the multifaceted pressures facing LDCs, leading many LDCs to consider how to transition their business model into a low-carbon future.

Enter hydrogen, which has been touted as one potential option for decarbonizing numerous end uses, including many of those currently served by natural gas via LDCs. Over the last few years, interest in hydrogen has experienced a renaissance, today being referred to as the "Swiss Army knife of decarbonization" because of its broad range of potential applications in the energy transition.[12] A number of these potential applications are relevant to LDCs. For example, the Hydrogen Council has written that "[h]ydrogen in gaseous form can provide a low-carbon alternative to natural gas heating as it can largely utilise the same infrastructure network – from pipelines to the boilers themselves."[13] The same study concluded that of the limited options for decarbonizing this sector, hydrogen solutions are "among the most cost-effective and flexible ways to facilitate . . . transition."[14]

At the same time, it is not difficult to find hydrogen skeptics. Consumers of energy news will remember the joke bordering on adage, "[hydrogen] is the fuel of the future — and always will be."[15] There are historical justifications for this uncertainty: hydrogen was floated during the fossil fuel shortages of the 1970s and 1980s as a potential solution.[16] And during the 1990s, carmakers had costly false

10. Taylor Kuykendall, *Path to net zero: Miners are starting to decarbonize as investor pressure mounts*, S&P GLOB. MKT. INTEL (Jul. 28, 2020), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/path-to-net-zero-miners-are-starting-to-decarbonize-as-investor-pressure-mounts-59583837.

11. *Fortune Global 500 Climate Commitments*, CLIMATE IMPACT PARTNERS, https://www.climateimpact.com/news-insights/fortune-global-500-climate-commitments/.

12. William G. Bolgiano, *FERC's Authority to Regulate Hydrogen Pipelines Under the Interstate Commerce Act*, 43 ENERGY L.J. 1 (2022). While this article focuses primarily on end uses for hydrogen of relevance to LDCs, William Bolgiano's recent article published in this journal provides a thorough summary of the other potential applications of hydrogen.

13. HYDROGEN COUNCIL, PATH TO HYDROGEN COMPETITIVENESS: A COST PERSPECTIVE 51 (2020), https://hydrogencouncil.com/wp-content/uploads/2020/01/Path-to-Hydrogen-Competitiveness_Full-Study-1.pdf.

14. *Id.*

15. *The future, finally*, THE ECONOMIST (Feb. 15, 2013), https://www.economist.com/schumpeter/2013/02/15/the-future-finally (tracing major carmakers' experimentation with vehicles powered by hydrogen fuel cells).

16. Llewellyn King, *Hydrogen Is Back as the Green Fuel of the Future*, ENERGYCENTRAL (Feb. 1, 2020), https://energycentral.com/c/um/hydrogen-back-green-fuel-future.

starts exploring replacing passenger cars' internal combustion engines with hydrogen fuel-cells.[17] There are also numerous technical and practical challenges associated with hydrogen. These challenges include the lack of certainty surrounding end-use applications and that pure hydrogen cannot be transported on conventional natural gas pipelines without significant risk of embrittlement.[18] Decades on, hydrogen is still being described as the fuel of the future: many of today's hydrogen-hopeful headlines end in a question mark, reinforcing the entrenched uncertainty towards a fuel whose end use and exact role in the clean energy transition remain the subject of ongoing debate.[19] Yet an undeniably new characteristic of today's reinvigorated interest in hydrogen is that there are now real financial incentives for the development of hydrogen projects, resulting in investments in hydrogen projects across the U.S.[20] There also is a wealth of new literature on hydrogen's potential uses in the energy transition, some of which we explore here.

Against this backdrop, this article explores the potential role that hydrogen could play in LDCs' energy transition strategies. Although some LDCs also serve retail electric customers, this article focuses on gas LDCs, as such LDCs face the greatest downside risk from decarbonization trends. This article also focuses primarily on private LDCs rather than municipalities that serve gas retail customers, which are generally subject to a different regulatory regime. It is worth noting, however, that many of the practical considerations discussed herein will still be relevant for such municipalities if they are considering integrating hydrogen into their business model.

The article begins with an overview of the gas LDC business model, which is crucial to understanding what end-uses such LDCs serve and what constraints affect their decision-making. The article then provides a deeper analysis of some of the drivers behind LDCs' decarbonization efforts, as the impetus behind an LDC's decision to decarbonize may impact the goals and strategies an LDC may use. The article then analyzes some of the practical and legal challenges to LDCs integrating hydrogen into an energy transition strategy. Finally, it will attempt to provide a framework for LDCs and stakeholders considering if, and how, LDCs can integrate hydrogen into their business model.

This article does not seek to provide a single, easy answer to the question of how an LDC can best use hydrogen as part of a successful energy transition plan

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17. Vijay Vaitheeswaran, *Hydrogen hype is rising again--will this time be different?*, THE ECONOMIST (Nov. 14, 2022), https://www.economist.com/the-world-ahead/2022/11/14/hydrogen-hype-is-rising-again-will-this-time-be-different; *The future, finally*, *supra* note 15.

18. UNIV. OF CAL., RIVERSIDE, HYDROGEN BLENDING IMPACTS STUDY (2022), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF.

19. Alan Ohnsman, *Is Green Hydrogen The Fuel Of The Future? This CEO Is Betting On It*, FORBES (Nov. 17, 2022), https://www.forbes.com/sites/alanohnsman/2022/11/17/green-hydrogen-plug-power-andy-marsh; Vaitheeswaran, *supra* note 17; Jim Park, *Is Hydrogen Really Trucking's Fuel of the Future?*, TRUCKINGINFO (Sept. 23, 2022), https://www.truckinginfo.com/10181511/is-hydrogen-really-truckings-fuel-of-the-future (contrasting European versus North American development and deployment of green hydrogen technologies and the trucking industry's role in both transporting hydrogen and running off of it); Miles O'Brien et al., *Could hydrogen be the clean fuel of the future?*, PBS NEWSHOUR (Apr. 20, 2022), https://www.pbs.org/newshour/show/could-hydrogen-be-the-clean-fuel-of-the-future; King, *supra* note 16.

20. *See infra* notes 54, 158-162 and accompanying text (describing, among other federal programs and incentives, the Inflation Reduction Act and the U.S. Department of Energy's Hydrogen Hubs).

because there is none. How could there be when there are over 2,000 LDCs across the U.S.[21] with unique systems and customer profiles, subject to differing regulatory regimes depending on their location and status as a public or private entity? Rather, the goal of this article is to serve as a resource for LDCs and other stakeholders considering what role hydrogen can play in an LDC's transition to a lower-carbon future, identifying key issues and sources to help guide that analysis. Hydrogen will not be a silver bullet for LDCs seeking to successfully transition into a low-carbon future. Nonetheless, with appropriate planning and action by an LDC, hydrogen may be able to serve as a key component of an LDC's energy transition strategy.

II. THE LDC MODEL

Before exploring the ways in which an LDC may integrate hydrogen into its energy transition strategy, it is essential to have a high-level understanding of the LDC business model and how LDCs fit into the natural gas supply chain, including the types of customers and end-uses served by LDCs.

People have been using gas in their everyday lives long before the LDC delivery model existed. In the nineteenth century, while gas was manufactured from commodities like coal, it was understood that natural gas could be used for similar end uses if it could be harnessed.[22] The challenge was extracting such gas and getting it to market, as the necessary technology did not exist.[23] It was not until more advanced steel compositions and welding techniques developed in the first quarter of the twentieth century, enabling the construction of high-pressure pipelines, that natural gas could be moved over long distances at low costs.[24]

As new pipelines spread, the importance of state regulatory bodies became apparent. Consumers and communities discovered that competition alone offered insufficient protection.[25] Indeed, the ruthless competition that arose in the absence of government regulation had disastrous effects on both rates and the physical environment, with "an initial period of 'wasteful competition' followed by a massive consolidation and the threat of monopolistic pricing."[26] In answer, states began regulating natural gas companies as retail monopolies. After surviving numerous legal challenges on dormant Commerce Clause grounds, states were secure in their authority to regulate "as a matter of local concern, all direct sales of gas to consumers within their borders, absent congressional prohibition of such state regulation."[27]

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21. Mike Kopalek, *U.S. homes and businesses receive natural gas mostly from local distribution companies,* U.S. ENERGY INFO. ADMIN. (Jul. 31, 2020), https://www.eia.gov/todayinenergy/detail.php?id=44577.

22. General Motors Corp. v. Tracy, 519 U.S. 278, 288 (1997).

23. *Id.*

24. *Id.*

25. *Id.*

26. *Tracy*, 519 U.S. at 289. The Supreme Court recounts how during this initial period of wasteful competition, citizens "suffered the inconvenience of city streets being constantly torn up and replaced by installation and relocation of duplicate facilities." *Id.* at 289 n.5.

27. *Id*. at 290.

When the federal government began to regulate the natural gas industry, Congress recognized this history of state regulation and preserved a role for state regulators. So while the Natural Gas Act (NGA), signed in 1938, regulated interstate natural gas pipelines, it "explicitly exempted 'local distribution of natural gas' from federal regulation."[28] The NGA's purpose was to "fill the regulatory void created by the Court's earlier decisions prohibiting States from regulating interstate transportation and sales for resale of natural gas, while at the same time leaving undisturbed the recognized power of the States to regulate all in-state gas sales directly to consumers."[29]

Thus, the LDC business model today is primarily regulated at the state level.[30] Generally, state public utility commissions (PUCs)[31] regulate how most LDCs operate their businesses and set limits on the maximum return LDCs can earn in their operations. In many states, the relevant PUC grants the LDC the exclusive right to distribute gas directly to retail customers in a particular region (often in the form of a certificate or franchise), unless the PUC grants an exception permitting another company the right to distribute gas to retail customers in such region.[32] In return, the LDC must provide service to all customers within that region at the prices and terms approved by the PUC.[33]

State-level gas utility planning differs across jurisdictions but often consists of a variety of objective-based processes with varying time horizons.[34] A minority of states, including Oregon, Washington, Rhode Island and New York, have adopted an Integrated Resource Planning (IRP) or similar model for their gas utilities, similar to the planning process required of electric utilities.[35] Whether using a traditional gas supply planning or IRP process, proceedings vary across states. In most states, to develop an LDC's maximum annual revenue, the LDC and PUC agree on an annual revenue requirement. In general, PUCs will try and calculate the revenue requirement in close collaboration with LDCs using a formula that takes into account the LDC's regulated rate of return, the depreciated utility rate base (which is discussed further below), depreciation, and taxes.

The regulated rate of return is a value the regulator allows the LDC to earn on the undepreciated capital it has invested to deliver a regulated commodity—natural gas or, in the future, potentially a natural gas-hydrogen blend[36] or pure

28. *Id*. at 291.

29. *Id*. at 292.

30. *Tracy*, 519 U.S. 278.

31. In many states, the relevant regulatory body is not actually referred to as a PUC. However, for ease of discussion, this article will use the term PUC to refer to the relevant state agency that regulates LDCs.

32. LOWELL E. ALT, JR., ENERGY UTILITY RATE SETTING 18 (Lulu 2007).

33. *Id.*

34. Elaine Prause, *Modernizing Gas Utility Planning: New Approaches for New Challenges* 5, REGUL. ASSISTANCE PROJECT (2022), https://www.raponline.org/wp-content/uploads/2022/09/rap-prause-modernizing-gas-utility-planning-new-approaches-new-challenges-2022-september.pdf. Prause's article provides a helpful graphic for visualizing the time frames and scope of typical gas planning processes, including distribution planning, capacity planning and supply planning.

35. *Id*. at 6.

36. When referring to a "blend" of hydrogen in the LDC's distribution system, we are referring to a blend by volume rather than by mass or energy. This is discussed further in Section IV.B.

hydrogen—to customers within their service territory.[37] A PUC will generally seek to balance the LDC's customers' need for low-cost and reliable service to their homes and businesses and the LDC's need for access to an economic source of capital.[38] It is the balance to which LDCs are accustomed for their natural gas businesses that will be just as relevant for any expansion into hydrogen.

Such balance is an essential component of the conversation between any LDC and its state PUC today, which often come in the form of rate cases. If the regulated rate of return is set too high, the LDC will have access to lower-cost capital, but ratepayers will end up paying more for a given service.[39] In the alternative scenario where the rate of return is unnecessarily low, ratepayers will have access to low-cost service, but the LDC will not be able to access low-cost capital from the public markets.[40] Ideally, LDCs and their PUCs, in open and transparent proceedings, find the middle ground that allows the LDC access to reasonably priced capital while providing ratepayers with affordable service.[41] The ultimate rate the LDC is allowed to recover from its ratepayers considers the LDC's weighted average cost of capital based, in part, on the LDC's debt ratio among many other financial metrics.[42]

Capital investments the LDC makes in infrastructure to deliver natural gas to its customers are summed into a figure called the "rate base." This value is a measure of the LDC's total investment in the system.[43] Each year, the LDC can make more capital investments in the rate base, but the rate base also depreciates.[44] At the end of a given year, the rate base will reflect the capital investment made throughout the year less the depreciation on the existing rate base. The resultant value is the depreciated utility rate base which is multiplied by the regulated rate of return to give the LDC's annual regulated return. The LDC is also authorized to recover the depreciation incurred throughout the year and the taxes incurred from the sale of natural gas to their ratepayers.[45]

Generally, PUCs allow the LDC to pass through the costs associated with procuring natural gas from its suppliers and operating the system to its ratepayers. The LDC is not allowed to recover any margin on those costs. Any margin the LDC earns comes through the LDC's investment in the rate base and the associated return allowed by the regulator. Moreover, each LDC is generally only permitted to invest in the distribution and sale of natural gas within its established service territory.[46]

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37. *See infra* sections IV and V (discussing the practical and legal challenges an LDC may face in integrating hydrogen to its distribution system).

38. Prause, *supra* note 34, at 18-19.

39. *Id.*

40. *Id.*

41. *Id*. at 8.

42. FERC, COST-OF-SERVICE RATES MANUAL 14 (1999), https://www.ferc.gov/sites/default/files/2020-08/cost-of-service-manual.pdf (specifics regarding the rate of return calculation may vary by PUC, but general discussion of how the rate of return is set for regulated entities is shown here).

43. *Id*. at 8.

44. *Id*.

45. *Id.* at 25-26.

46. COST-OF-SERVICE RATES MANUAL, *supra* note 42.

Historically, LDCs were owned by broader utility holding companies that owned and operated the entire natural gas value chain, including natural gas production.[47] The natural gas value chain is shown in Figure 1 below, for reference.

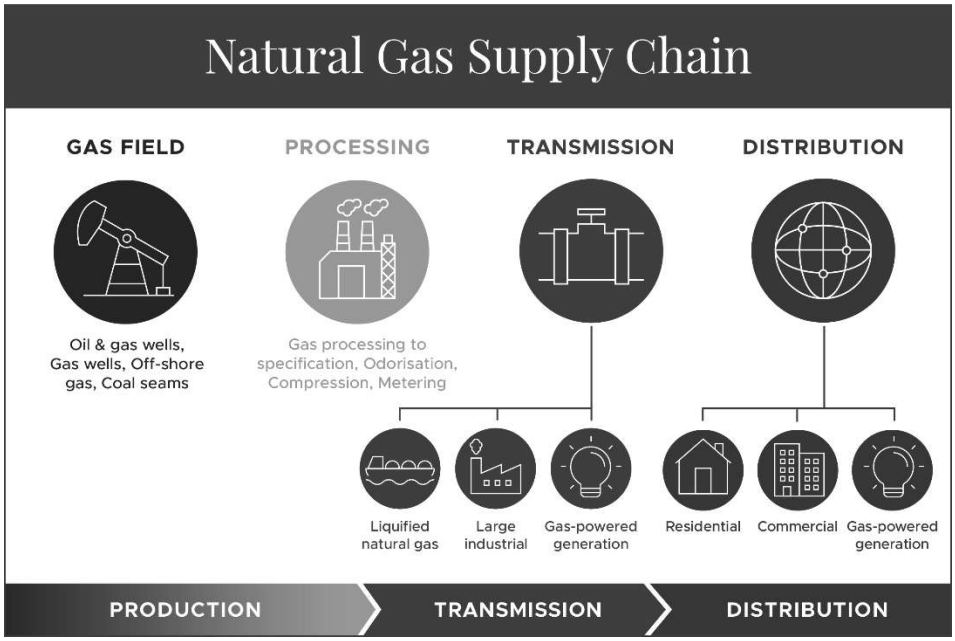

Figure 1. Natural Gas Supply Chain.

Today, LDCs are less likely to be affiliated with upstream producers and transporters of natural gas. Rather, they primarily serve residential and commercial customers, delivering approximately 90% of end-use natural gas to these sectors in 2018.[48] LDCs serve electric power generators, but at a much lower level on average: 75% of natural gas deliveries to electric power sector customers in 2018 were via pipeline companies, while 18% of natural gas deliveries to electric power sector customers in 2018 were via LDCs.[49] Industrial customers, too, are more likely to be served by pipeline companies (51% of deliveries in 2018), but also receive a significant percentage of deliveries from LDCs (34% of deliveries

47. JEFF D. MAKHOLM, THE POLITICAL ECONOMY OF PIPELINES: A CENTURY OF COMPARATIVE INSTITUTIONAL DEVELOPMENT, at 121, (Univ. of Chi. Press 2012). Through the Public Utility Holding Company Act of 1935, 15 U.S.C.A § 79 (repealed in 2005 and replaced with the Public Utility Holding Company Act of 2005), the Securities and Exchange Commission was given the authority to investigate and simply holding company structures. *Id.* The Securities and Exchange Commission's goal was to establish "integrated distribution systems . . . confined to a single regional area and ensure that no holding company was so large as to impair local management, effective operation, or effective regulation." *Id.*

48. Kopalek, *supra* note 21.

49. *Id.*

in 2018).[50] It is important to note, however, that these percentages are aggregate numbers for the entire U.S. market—the concentration of any particular customer class varies widely across LDCs.

These residential, commercial, and industrial LDC customers use natural gas for different purposes. Residential customers use natural gas to heat buildings and water, cook, and dry clothes.[51] Commercial customers use natural gas to heat buildings and water, operate refrigeration and cooling equipment, cook, dry clothes, and provide outdoor lighting.[52] Industrial customers use natural gas for process heating, in combined heat and power systems, as feedstock to produce chemicals, fertilizer, and hydrogen, and as plant fuel.[53] These customers could use hydrogen as a fuel replacement for natural gas.[54] To deliver hydrogen to these different demand sectors, LDCs can supply hydrogen to their customers by either developing a new hydrogen-specific pipeline along an existing gas pipeline or blending hydrogen into an existing natural gas pipeline.[55] Blending hydrogen into natural gas pipelines taps into an LDC's ability to leverage the existing infrastructure and, therefore, may be a cost-effective way of introducing hydrogen to new customers.[56] However, there are significant hurdles that must be acknowledged and addressed before an LDC opts to move hydrogen on their system. These challenges are discussed in detail in section IV.

III. DECARBONIZATION CHALLENGES TO THE LDC MODEL

As noted above, there are numerous developments leading LDCs to consider how to transition into a low-carbon future. However, these developments are not affecting all LDCs equally—some states have not adopted emissions reduction targets, and other states have preempted gas bans with proactive legislation limiting municipalities' ability to adopt such codes and regulations. And yet it is unavoidable that these developments can deeply impact how an LDC's energy transition strategy will develop. As such, this section discusses these three main developments that may shape an LDC's energy transition strategy: state decarbonization targets and energy transition proceedings, gas bans, and private sector and other pressures.

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50. *Id.*

51. *Natural Gas Explained: Use of Natural Gas*, *supra* note 1.

52. *Id.*

53. *Id.*

54. Currently, the Department of Energy is investing $7 billion on the H2Hubs program to scale up clean hydrogen production and develop ecosystems for hydrogen utilization in a diversity of end-uses such as transportation and power generation. *See* Hannah Murdoch et al., *Pathways to Commercial Liftoff: Clean Hydrogen* 2 (2023), U.S. DEP'T OF ENERGY, https://liftoff.energy.gov/wp-content/uploads/2023/03/20230320-Liftoff-Clean-H2-vPUB.pdf. These projects can demonstrate end-use cases for hydrogen and provide insight on infrastructure needs to develop a network.

55. *Hydrogen Pipelines*, U.S. OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/fuelcells/hydrogen-pipelines; *see also,* M. W. Melaina et al., *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues*, NAT'L RENEWABLE ENERGY LAB'Y (2013), https://www.nrel.gov/docs/fy13osti/51995.pdf.

56. Kevin Topolski et al., *Hydrogen Blending into Natural Gas Pipeline Infrastructure: Review of the State of Technology*, NAT'L RENEWABLE ENERGY LAB'Y (2022), https://www.nrel.gov/docs/fy23osti/81704.pdf.

A. State decarbonization targets and "transition proceedings"

Across the U.S., states have adopted ambitious decarbonization goals and targets. For example, in New York, the 2019 Climate Leadership and Community Protection Act (CLCPA) created a standard to achieve net-zero greenhouse gas emissions by 2050 and use emissions-free electric power sources by 2040.[57] In another instance, through the 2020 Global Warming Solutions Act (GWSA), Massachusetts established a legally binding target to reach net-zero greenhouse gas emissions by 2050.[58] The logical next step arising from the adoption of these targets is that instrumentalities of the state begin to take action to achieve the target. Thus, perhaps unsurprisingly, in response to these ambitious state decarbonization targets, several PUCs have opened gas utility planning proceedings.[59] This section looks at one such proceeding—initiated in New York—to analyze how an LDC's decision-making may be affected by such proceedings.[60]

In 2020, the New York Public Service Commission (NYPSC) opened a natural gas planning proceeding to establish new planning and operational practices to support customer needs and emission objectives, while curtailing fossil fuel infrastructure investments.[61] The primary impetus behind the proceeding was the passage of the CLCPA.[62] Another impetus for initiating the proceeding, however, was the moratoria on new service connections adopted by several LDCs.[63] The NYPSC reasoned that the old systems needed to be reformed because LDCs have not "kept pace with recent developments and demands on energy systems."[64]

In the proceeding, the NYPSC emphasized the need for LDCs to provide information so that alternatives to firm gas service and fuel choices are consistent with the state's energy policies.[65] Therefore, the NYPSC ordered the state's largest LDCs to file: (1) a supply and demand analysis with regard to the utility's entire service territory, (2) a supply and demand analysis with regard to areas vulnerable

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57. *N.Y. State Climate Action Council Draft Scoping Plan*, N.Y. STATE CLIMATE ACTION COUNCIL (Dec. 30, 2021), https://climate.ny.gov/resources/draft-scoping-plan/.

58. MASS. GEN. LAWS. CH. 298, § 3(a) (2020).

59. *State Clean Energy Policy Tracker*, NAT'L REG. RES. INST., https://www.naruc.org/nrri/nrri-activities/clean-energy-tracker/; MD. COMM'N ON CLIMATE CHANGE, BUILDING ENERGY TRANSITION PLAN (2021), https://mde.maryland.gov/programs/air/ClimateChange/MCCC/Documents/2021%20Annual%20Report%20Appendices%20FINAL.pdf.; Tom DiChristopher, *Seeking emission cuts, Colo. regulators propose major gas utility rule changes*, S&P GLOB. MKT. INTEL. (Oct. 7, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/seeking-emissions-cuts-colo-regulators-propose-major-gas-utility-rule-changes-66995434.

60. *Proceeding on Motion of the Commission in Regard to Gas Planning Procedures*, N.Y PUB. SERV. COMM., Case No. 20-G-0131, at 1 (Mar. 19, 2020), https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-g-0131#.

61. *Id.* at 3.

62. *Id.*

63. *About the Westchester Natural Gas Moratorium*, CONEDISON, https://www.coned.com/en/our-energy-future/electric-heating-and-cooling-equipment/about-the-westchester-natural-gas-moratorium; *Ongoing scrutiny of NY gas moratorium prompts reform at National Grid*, S&P GLOB MKT. INTEL. (Mar. 30, 2020), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/ongoing-scrutiny-of-ny-gas-moratorium-prompts-reform-at-national-grid-57822332.

64. *Proceeding on Motion of the Commission in Regard to Gas Planning Procedures*, *supra* note 60, at 2.

65. *Id.* at 12-14.

to supply constraints, (3) a proposal for peaking services and moratorium management issues, and (4) a status report and proposals discussing the extent that the utility currently uses or plans to use demand reducing measures, including fuel supply alternatives and non-pipe solutions, to aid in the management of moratoria.[66] After receiving the requested filings and additional comments, the NYPSC issued a combined order for two different cases that approved a gas planning process.[67]

The order outlining the planning process requires New York's eleven largest LDCs to file proposed long-term plans every three years with the goal of engaging in a stakeholder engagement process.[68] With each filing, the LDC must outline one scenario with a "no infrastructure option" such as non-pipe alternative (NPA) solutions.[69] Additionally, the NYPSC recommended that LDCs quantify the availability of renewable natural gas or biogas as part of the supply forecast in their long-term plans.[70] The NYPSC recognized the potential role of hydrogen in decarbonizing the distribution system and committed to considering its use in future phases of the proceeding.[71] The NYPSC did recognize that while "use of NPAs instead of building new infrastructure is preferable in light of CLCPA targets . . . suggesting all new infrastructure needs or continued maintenance of the gas system could be met with NPAs may not be possible."[72] Therefore, while the NYPSC still required LDCs to provide "no infrastructure" scenarios in their long-term plans, the NYPSC permits an LDC to assert such a scenario is not feasible for either a particular project or a portion of their long-term plan.[73] Should an LDC make this assertion, the LDC is required to submit supporting documentation which would be "vigorously" tested by NYPSC staff.[74]

This proceeding, and particularly the directives issued to the LDCs, is informative because it demonstrates just how an LDC's energy transition strategy, and its ability to incorporate hydrogen, may be impacted by directives from its regulators. If a regulator directs LDCs to lead with "no infrastructure options," opportunities for such LDCs to build new pipeline infrastructure that is capable of handling higher percentages of hydrogen will be limited.

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66. *Order Adopting Gas System Planning Process*, N.Y. PUB. SERV. COMM., Case Nos. 20-G-1031, 12-G-0297 (2022), https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=20-g-0131#.

67. *Id.* at 8-10.

68. *Proceeding on Motion of the Commission to Examine Policies Regarding the Expansion of Natural Gas Service*, N.Y PUB. SERV. COMM., Case 12-G-0297 at 11 (Order Adopting Gas System Planning Process, May 12, 2022).

69. *Id.* A "no infrastructure" component of a filing means, in addition to other options proposed by LDCs, where an LDC includes some combination of demand response and NPAs such as seasonal and peak day rates which close the gap between demand and supply. *Id*. at 35.

70. *Id.* at 54.

71. *Id.* at 63-64.

72. *Proceeding on Motion of the Commission to Examine Policies Regarding the Expansion of Natural Gas Service*, *supra* note 68, at 36.

73. *Id.* at 36-37.

74. *Id*. at 37.

B. Gas bans and "stretch" codes

Transition proceedings are not the only method by which state and local governments are addressing climate change. To curb fossil fuel emissions, many states and municipalities across the United States have taken steps to rewrite state and local energy and housing codes. These revisions include prohibitions on new natural gas hook ups in new buildings, sometimes referred to as "gas bans."[75] These gas bans generally prohibit appliances that use fossil fuels to generate heat, such as gas furnaces, stoves or ovens, with the goal of limiting emissions caused by residential, commercial, and industrial consumers.[76] As discussed further below, these bans, where adopted, have significant implications for an LDC's energy transition strategy, including the ability to blend hydrogen.

Berkeley, California, became the first city in the U.S. to ban natural gas in 2019; as of June 2022, seventy-seven cities in ten states have followed suit.[77] Currently, Washington and California are the only states that have approved of statewide restrictions on the use of fossil fuels, however they may soon be joined by other states.[78] California was the first state to pass a gas ban through a building code that requires new homes and buildings to either be equipped with a highly-efficient heat pump for space and water heating, or face a high energy efficiency requirement.[79] Building on this momentum, the Bay Area Air Quality Management District adopted new zero-emission appliance rules, where only zero-emission water heaters can be sold or installed in the California Bay Area starting in 2027. Such rules would apply only to new furnaces and commercial water heaters in 2029 and 2031 respectively, and would not mandate the replacement of existing appliances. The rule also does not apply to cooking appliances, including gas

75. Ella Nilsen, *Cities tried to cut natural gas from new homes. The GOP and gas lobby preemptively quashed their effort,* CNN POLITICS (Feb. 12, 2022) https://www.cnn.com/2022/02/17/politics/natural-gas-ban-preemptive-laws-gop-climate/index.html.

76. *Id*.

77. Jen A. Miller, *Natural gas legislation: What multifamily developers, owners need to know,* UTILITYDIVE (June 2, 2022), https://www.utilitydive.com/news/natural-gas-legislation-what-multifamily-developers-owners-need-to-know/624779/. As with other topics discussed in this article, "gas bans" are evolving policy issues subject to ongoing litigation, which means as a matter of policy such bans and challenges to them are not as of this writing settled issues. In April 2023, a Ninth Circuit panel reversed an earlier California federal court's dismissal of a challenge to Berkeley's ban, finding the city had "waded into a domain preempted by Congress." California Rest. Ass'n v. City of Berkeley, No. 21-16278, slip op. at 7 (9th Cir. 2023); Janie Har, *Court tosses Berkeley gas ban, but wider impact is unclear*, ASSOCIATED PRESS (Apr. 18, 2023), https://apnews.com/article/berkeley-california-natural-gas-ban-overturned-court-3546acbaec5db011c89a 610baa42cebc; *Court throws out Berkeley, California's ban on natural gas*, ASSOCIATED PRESS (Apr. 18, 2023), https://apnews.com/article/berkeley-california-natural-gas-ban-overturned-appeals-court-7dafca58d1996 3f322100d73caf9c31a.

78. David Iaconangelo, *East Coast's first countywide gas ban passed in Md.,* E&E NEWS (Nov. 30, 2022), https://www.eenews.net/articles/east-coasts-first-countywide-gas-ban-passed-in-md/.

79. Caleigh Wells, *California plans to phase out new gas heaters by 2030*, NAT'L PUBLIC RADIO (Sept. 23, 2022), https://www.npr.org/2022/09/23/1124511549/california-plans-to-phase-out-new-gas-heaters-by-2030; *California Passes Nation's First Building Code that Establishes Pollution-free Electric Heat Pumps as Baseline Technology; Leads Transition Off of Fossil Fuels in New Homes*, NAT. RES. DEF. COUNCIL (Aug. 11, 2021), https://www.nrdc.org/media/2021/210811-0.

stoves.[80] Similarly, Washington state enacted its ban through its Clean Buildings Act, which mandates new commercial buildings and large multifamily apartments to install electric heat pumps to warm air and water.[81] Following this legislation, Washington's State Building Code Council approved similar heat pump mandates for newly constructed smaller residential buildings, which as of this writing is currently being challenged by a coalition which includes building industry groups.[82] Separately, State Department of Commerce has begun a rulemaking process for the state's expanded Clean Buildings Performance Standard. The state is required to complete the rulemaking by December 1, 2023.[83]

In the northeast, New York and Massachusetts have either adopted or are exploring similar measures.[84] In 2021, New York City announced it would phase out fossil fuel usage in newly constructed residential and commercial buildings, with certain exemptions (commercial kitchens, laundromats, manufacturing operations, hospitals, crematoriums and emergency power) and two separate effective dates in 2024 and 2027 based on building height.[85] The same law also requires the Mayor's Office to study heat pump technology and electrical grid readiness.[86] As of this writing, New York state lawmakers are pursuing similar efforts, which, if enacted, would make it the first state to enact a full natural gas ban for new buildings, building on the efforts of New York City and other cities and counties.[87]

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80. *Air District approves phasing out new natural gas furnaces, water heaters*, CBS BAY AREA (Mar. 15, 2023), https://www.cbsnews.com/sanfrancisco/news/natural-gas-furnace-water-heater-phase-out-ban-bay-area-air-district/; Claire Hao, *Bay Area will end sales of gas furnaces and water heaters. Here's what it means for you*, SAN FRANCISCO CHRON. (Mar. 15, 2023), https://www.sfchronicle.com/bayarea/article/bay-area-end-sales-natural-gas-furnaces-water-17841072.php.

81. David Iaconangelo, *Building codes: The new natural gas battlefront?*, ENERGYWIRE (May 3, 2022), https://subscriber.politicopro.com/article/eenews/2022/05/03/building-codes-the-new-natural-gas-battlefront-00027828.

82. Melissa Santos, *State's plan to phase out natural gas in buildings prompts lawsuit*, AXIOS SEATTLE (Mar. 2, 2023), https://www.axios.com/local/seattle/2023/03/02/washington-state-heat-pump-rules-electric.

83. *Owners of buildings over 20,000 sq. ft. invited to participate in state Clean Buildings expansion rulemaking*, NEWSWIRES (Apr. 4, 2023), https://www.einnews.com/pr_news/626114347/owners-of-buildings-over-20-000-sq-ft-invited-to-participate-in-state-clean-buildings-expansion-rulemaking. The rulemaking began with an introductory webinar discussing the basics of the Clean Buildings Program and was the first of several workshops which, according to the state, are "an opportunity for communities, building owners and the industry to help shape how buildings operate, the cost to maintain them, and the role they play in reaching Washington state's energy efficiency and emission reduction goals." *Id*.

84. David Iaconangelo, *Mass. Unveils plans to roll back gas in new buildings,* E&E NEWS (Jan. 1, 2023) https://www.eenews.net/articles/mass-unveils-plans-to-roll-back-gas-in-new-buildings/; *Mayor de Blasio Signs Landmark Bill to Ban Combustion of Fossil Fuels in New Buildings*, CITY OF NEW YORK (Dec. 22, 2021), https://www.nyc.gov/office-of-the-mayor/news/852-21/mayor-de-blasio-signs-landmark-bill-ban-combustion-fossil-fuels-new-buildings.

85. *Mayor de Blasio Signs Landmark Bill to Ban Combustion of Fossil Fuels in New Buildings*, *supra* note 84; Marie French, *Hochul backs eventual bans on gas furnaces and stoves in new buildings*, POLITICO (Jan. 13, 2023), https://www.politico.com/news/2023/01/13/hochul-backs-ban-gas-furnaces-stoves-00077751.

86. *Id.*

87. Maxine Joselow & Vanessa Montalbano, *New York, citing consumer costs, may ease its greenhouse gas accounting rules*, WASH. POST (Apr. 4, 2023), https://www.washingtonpost.com/politics/2023/04/04/new-york-citing-consumer-costs-may-ease-its-greenhouse-gas-accounting-rules/; Marie French, *New York nears deal to ban gas stoves in new homes*, POLITICO (Mar. 23, 2023), https://www.politico.com/news/2023/03/23/new-york-gas-stoves-ban-00088648; Lamar Johnson, *New York state relights the gas stove wars*, POLITICO (Mar. 16,

Separately, the Massachusetts Department of Energy Resources released a draft rule for public comment in December of 2022 where, as part of a demonstration program, up to ten Massachusetts towns and cities can ban fossil fuels in new buildings.[88] As of January 2023, under the program known as the Municipal Fossil Fuel Free Building Construction and Renovation Demonstration Project, new residences must meet certain requirements, such as being "pre-wired" for electrification where owners would be positioned to swap gas appliances for electric equivalents without facing major renovations.[89]

At the city and county level, such codes are known as "reach" or "stretch" codes, because they "reach" or "stretch" beyond the promulgated base building code, enabling a municipality or other body of government to set mandatory or voluntary compliance pathway for its buildings.[90] As described by the New Buildings Institute,

> [w]hen base codes are not keeping up with advances in technology and design practices, stretch codes provide an opportunity to train the building and development communities in advanced practices before the underlying energy code is improved and help accelerate market acceptance and adoption of more stringent energy efficiency codes in the future.[91]

Model code authors, including advocacy organizations and the U.S. Department of Energy's Building Energy Codes Program, play an important role in facilitating such code rewrites.[92] Such codes can align with utility energy efficiency programs, incentivizing LDCs to help municipalities adopt programs.[93]

However, "reach" or "stretch" codes can also facilitate the aforementioned gas bans. Such codes are the means by which local governments can prohibit new natural gas hook ups in new buildings, dissuading use of fossil fuels for heating, cooking or other household appliances and limiting emissions from the same while

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2023), https://www.politico.com/newsletters/power-switch/2023/03/16/new-york-state-relights-the-gas-stove-wars-00087440.

88. *Municipal Fossil Fuel Free Building Demonstration Program*, MASS. DEP'T OF ENERGY RES. (Dec. 23, 2022), https://www.mass.gov/info-details/municipal-fossil-fuel-free-building-demonstration-program.

89. *Mass. unveils plans to roll back gas in new buildings*, *supra* note 84.

90. *Stretch Codes*, NEW BLDG. INST., https://newbuildings.org/code_policy/utility-programs-stretch-codes/stretch-codes/.

91. *Id*.

92. *Stretch Codes*, U.S. OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energycodes.gov/stretch-codes (stating that the U.S. Department of Energy, in collaboration with the Pacific Northwest National Laboratory, is developing technical briefs to aid all levels of government in updating their building codes, and further stating that the department "supports the advancement of building energy codes, including stretch codes that empower states and local governments in achieving their energy and climate goals"); *see* NEW BLDG. INST., *supra* note 90 (describing "stretch" codes and their benefits to LDCs, including how such codes can work in concert with utility energy efficiency programs).

93. *Aligning Utility Programs with Codes*, NEW BLDG. INST., https://newbuildings.org/code_policy/utility-programs-stretch-codes/aligning-utility-programs-codes/. "Reach" or "stretch" codes are not inherently good or bad but represent yet another opportunity for LDCs to be part of the stakeholder process. LDCs are often able to offer expertise to other stakeholders and can take an active role in the drafting of such codes to help a local government achieve its goals while at the same time avoiding any unintentional stifling of innovation. To the extent a local government's goals are opposed to an LDC's objectives, such a stance still represents an opportunity for the LDC—and, by extension, that LDC's regulator—to ensure a local government is making a fully informed decision.

encouraging the replacement of such appliances or functions with electric equivalents.[94] Municipalities institute the bans through local ordinances, resolutions, building codes, or other requirements, while state governments are turning to legislation.[95] Most gas bans restrict the use of natural gas in only new construction, but at least one city has applied its ban to retrofits.[96] Not all stretch codes contain such provisions, but they are an important tool used by local governments in advancing decarbonization policy.

Conversely, as of February 2022, twenty states have passed preemption laws prohibiting local governments from implementing gas bans.[97] This means, generally, that some state legislatures are deploying their authority to overrule the ability of municipal governments to make policy in this area. States that have passed legislation outlawing such bans account for 31% of residential and commercial gas use across the country.[98]

Where so-called gas bans have been adopted, they will deeply shape an LDC's energy transition strategy, including the ability to utilize hydrogen. As discussed in section IV.B, existing natural gas infrastructure can only handle a blend of hydrogen into natural gas, potentially a relatively low percentage blend. An LDC will either face difficult stakeholder pressures or simply not be able to develop new natural gas infrastructure that can handle higher hydrogen blends if there are restrictions installing new natural gas hookups.[99] Where these gas bans exist, LDCs are likely already exploring how to refocus their business efforts. For example, based on the nuances of the specific code, statute or regulation, service to industrial customers, particularly those with few decarbonization alternatives to natural gas, and some commercial customers may still be permitted. Therefore, seeking to expand business to these classes of customers may be the best way to replace lost residential and commercial customers covered by the prohibitions. These customers also may be better situated to use hydrogen in the first place.[100]

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94. INST. FOR ENERGY RSCH., AN OVERVIEW OF NATURAL GAS BANS IN THE U.S. (2021), https://www.instituteforenergyresearch.org/wp-content/uploads/2021/08/Natural-Gas-Ban-Report_Updated.pdf; DiChristopher & Duquiatan*, supra* note 8.

95. Tom DiChristopher, *Gas Ban Monitor: Building electrification evolves as 19 states prohibits bans*, S&P GLOB. MKT. INTEL. (July 20, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/gas-ban-monitor-building-electrification-evolves-as-19-states-prohibit-bans-65518738.

96. *Id.* (noting that with the exception of Denver, Colorado, most ordinances restrict new residential and commercial building, with New York considering statewide mandates for new and existing buildings).

97. Alejandra Mejia Cunningham & Kimi Narita, *Gas Interests Threaten Local Authority*, NAT. RES. DEF. COUNCIL, https://www.nrdc.org/experts/alejandra-mejia/gas-interests-threaten-local-authority-6-states (last updated Feb. 22, 2022). These states are Alabama, Arkansas, Arizona, Florida, Georgia, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, New Hampshire, Ohio, Oklahoma, Tennessee, Texas, Utah, West Virginia and Wyoming. *Id*.

98. DiChristopher & Duquiatan, *supra* note 8.

99. *Id*.; *see* Daniel Esposito, *Gas Utilities Are Promoting Hydrogen, But It Could Be a Dead End For Consumers and The Climate*, FORBES (Mar. 29, 2022), https://www.forbes.com/sites/energyinnovation/2022/03/29/gas-utility-hydrogen-proposals-ignore-a-superior-decarbonization-pathway-electrification/?sh=6c6b2176a199.

100. *See* Murdoch et al., *supra* note 54, at 2 (articulating three anticipated phases of clean hydrogen expansion in the United States: near-term (2023-2026), where clean-hydrogen replaces unabated, carbon-intensive hydrogen; industrial scaling (2027-2034), where hydrogen costs call driven by economies of scale and continued

C. Private sector and other pressures

In addition to these governmental pressures, LDCs, like other major corporations evaluating and developing environmental, social and governance ("ESG") frameworks and programs, are facing growing private sector pressures to implement such programs, including by decarbonizing the services they deliver. Such pressures come from a variety of sources, including investors or consumers that are pushing towards net-zero targets, as well as decarbonization targets set by LDCs and their parent companies (sometimes in response to investor and consumer pressures). The impetus for these private sector initiatives is a multivariate combination of, among other things, government policy, shifting risk perceptions, and a general increased consciousness regarding potential impacts of climate change.[101] LDCs that are responding to such pressures, including net-zero initiatives, will face a different path than those LDCs that are responding to governmental initiatives.

The last few years have witnessed unprecedented private sector commitments towards achieving significant, measurable reductions in global emissions as companies identify and manage the risks elevated by a combination of ESG-conscious investors and/or such companies' own budding ESG frameworks. In Glasgow, COP26 in 2021 saw the formation of the Glasgow Financial Alliance for Net Zero.[102] The members of the Glasgow Financial Alliance for Net Zero—now totaling over 500 firms globally—have committed to using science-based guidelines to reach net-zero emissions by 2050, set interim targets for 2030, implement action to achieve such targets, stand up monitoring regimes to track such action plans and follow strict guidelines surrounding the use of offsets.[103] In the U.S., McKinsey estimates "400 large US-based companies" have made net-zero pledges, with some setting earlier milestones for incremental emissions reduction targets.[104]

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research and development, allowing build-out of midstream distribution and storage networks; and long-term growth (2035+), with a self-sustaining commercial market post-PTC expiration driven by at least four factors).

101. Paul Bodnar et al., *Managing the net-zero transition*, BLACKROCK INV. INST. (2022), https://www.blackrock.com/corporate/literature/whitepaper/bii-managing-the-net-zero-transition-february-2022.pdf. Such pressures from consumers and investors will likely increase as jurisdictions move towards mandatory climate risk disclosure standards, or as companies adopt similar reporting as a signal of their climate stewardship. *See* Charles Di Leva et al., *Accelerating Net-zero Pledges with Public-led Climate Financing*, INT'L INST. FOR SUSTAINABLE DEV. SDG KNOWLEDGE HUB (Nov. 9, 2022), https://sdg.iisd.org/commentary/guest-articles/accelerating-net-zero-pledges-with-public-led-climate-financing/ (detailing the efforts of the US, EU and international bodies in moving towards disclosure requirements and arguing such standards are long overdue: "[w]hile the days when a financial company could claim to be net zero, with no credible roadmap to get there, may not be over, these new reporting standards should help to limit greenwashing.").

102. *About us,* GLASGOW FIN. ALL. FOR NET ZERO, https://www.gfanzero.com/about/ (explaining the Glasgow Financial Alliance for Net Zero's goal to accelerate the transition to a net-zero global economy and describing the sector-specific alliances comprising over 500 firms in more than 50 jurisdictions).

103. *Id.*; *see generally* Ross Kerber & Noor Zainab Hussain, *Vanguard quits net zero climate effort, citing need for independence*, REUTERS (Dec. 7, 2022), https://www.reuters.com/business/sustainable-business/vanguard-quits-net-zero-climate-alliance-2022-12-07/ (discussing differences in the approach of certain asset managers).

104. Rory Clune et al., *Navigating America's net-zero frontier: A guide for business leaders*, MCKINSEY & CO. (May 5, 2022), https://www.mckinsey.com/capabilities/sustainability/our-insights/navigating-americas-net-zero-frontier-a-guide-for-business-leaders.

As far as LDCs, in 2018, Xcel Energy Inc., which serves 3.7 million electricity customers and 2.1 million natural gas customers across eight states, became the first major utility to set a net-zero emissions goal.[105] It pledged to cut carbon emissions from its *electric* utility business in Colorado and Minnesota by 86% in 2030 (from 2005 levels) and reach net zero from *both* power and natural gas operations by 2050.[106] Since that time, "virtually all leading U.S. utilities have . . . set[] greenhouse gas emissions reduction targets [or] making net-zero announcements."[107] S&P Global reports that twenty-five of the thirty largest power and natural gas companies (measured by market capitalization) have now set carbon reduction milestones.[108] In addition, three of these companies have included in their climate targets "all emissions connected with natural gas, including hard-to-measure Scope 3 emissions."[109] S&P Global observes that utility support for climate policies and state clean energy laws often overlap, and further provides a detailed breakdown of the climate goals of these top thirty utilities in the United States.[110]

These private sector pressures will affect LDCs in several ways. For an LDC that has itself adopted a net-zero target, any attempt to incorporate hydrogen into an energy transition strategy will have to consider emissions impacts. As discussed in section IV.D below, the emissions profile of hydrogen varies greatly depending on how it is produced. Even LDCs that have not adopted net-zero targets may face significant pressure from customers, particularly corporate customers, to reduce the emissions impact of the natural gas supplied or delivered by LDCs.

IV. PRACTICAL CHALLENGES TO LDCS INTEGRATING HYDROGEN

The ability to expand new natural gas infrastructure, future-proof that infrastructure for hydrogen, or explore investment in new types of infrastructure unique to hydrogen as a fuel source will vary widely across LDCs.[111] Just as legislation

105. Karin Rives, *Path to net-zero: Utility execs insist 'we can'*, S&P GLOB. MKT. INTEL. (June 9, 2022), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/path-to-net-zero-utility-execs-insist-we-can-69901885.

106. *Id.*

107. *Id.*

108. *Id*.

109. Rives, *supra* note 105. These three utilities are: CMS Energy, Dominion Energy, and Duke Energy Corp. *Id*.

110. *Id*. (providing net-zero targets for electric utilities, gas utilities and multi-utilities, and listing the five utilities that did not, as of S&P's writing, have net-zero targets).

111. "Future proof is a buzzword that describes a product, service or technological system that will not need to be significantly updated as technology advances." Alexandra Klass, *Future-Proofing Energy Transport Law*, 84 WASH. UNIV. L. Rev. 827, 828 n.1 (2017) (quoting *Future Proof*, TECHOPEDIA, http://www.techopedia.com/definition/2204/future-proof). Part of the goal of this section IV is to help LDCs identify some of the questions they should be asking as they consider how to future-proof their own infrastructure to maximize the likelihood that the assets they build now will retain their use and value as the energy transition advances and avoid the problem of stranded assets. *See* Catherine Morehouse, *Utilities don't see stranded assets as a top risk. Should they?*, UTILITYDIVE (Feb. 14, 2020), https://www.utilitydive.com/news/utilities-dont-see-stranded-assets-as-a-top-risk-should-they/572246/ (describing survey results, interviewing industry representatives and concluding that LDCs, "particularly vertically integrated [LDCs], may feel more confident in regulatory structures

and regulation varies across states and service territories, so too does infrastructure. LDCs seeking to incorporate hydrogen into their energy transition strategy will need to examine their service territories to better understand the practical challenges of integrating hydrogen into their energy transition strategy. For example, some of the opportunities and challenges, such as available end-uses, will not be relevant to all LDCs.

A. Limitations of existing infrastructure

One of the most commonly repeated cautions about the potential utility of hydrogen for LDCs is that the existing U.S. natural gas system cannot tolerate blending hydrogen into natural gas above a certain percentage, as hydrogen can embrittle pipes and have significant adverse impacts on end-use appliances.[112] As noted above, there have been studies indicating LDCs can safely blend anywhere from 5% to 20% hydrogen into the natural gas stream without needing to make significant upgrades to the system.[113] What is less commonly discussed, however, is that across the U.S., the composition of LDCs' systems varies greatly and will impact such LDCs' ability to blend hydrogen.[114] Indeed, the LDC's current asset base will be a significant driver when considering whether hydrogen can play a role in the business's future.

The studies to date indicate that while hydrogen can cause embrittlement in some steel grades, it may be less likely to degrade plastic pipe.[115] This suggests that LDCs with a system comprised of a higher percentage of plastic pipe may be able to blend a higher percentage of hydrogen into their existing systems with less risk of embrittlement.[116] Even amongst steel pipes there is a significant difference in terms of potential risk of embrittlement: the risk of hydrogen embrittlement is greater in high-pressure, high-strength steel typically used for natural gas transmission and lower in low-pressure, low-strength distribution pipes.[117]

Across the U.S., there is a significant range in the percentage of LDC systems that are comprised of plastic versus other materials. For example, in 2021, S&P Global analyzed a subset of LDCs with at least 5,000 miles of distribution mains and service lines.[118] According to S&P Global's analysis, the percentage of the

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and new financing mechanisms that will allow them to recover those costs, say some observers and stakeholders. Others warn [LDCs] should be cautious in their long-term investments, particularly if they want to stay on their customers' good side" while noting "some argue that building out that [pipeline] infrastructure still makes sense for a lower-carbon gas system, where today's natural gas is replaced by biofuels and hydrogen, which would still need a way to be transported.").

112. Esposito, *supra* note 99.

113. Melaina *et al.*, *supra* note 55.

114. *Id.* at v.

115. *Id.* at 22-23.

116. *Id.*

117. Paul W. Parfomak, *Pipeline Transportation of Hydrogen: Regulation, Research, and Policy*, CONGR. RSCH. SERV. 3 (2021), https://crsreports.congress.gov/product/pdf/R/R46700.

118. Tom DiChristopher & Anna Duquiatan, *Gas utilities make fewer leak repairs in 2020 as monitoring technology improved*, S&P GLOB. MKT. INTEL. (Oct. 28, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/gas-utilities-make-fewer-leak-repairs-in-2020-as-monitoring-technology-improved-67225162.

LDCs' systems that were comprised of plastic pipeline varied from 58.20% to 87.10%.[119] A chart excerpted from S&P's analysis is provided below:

			Share of mileage by pipeline material (%) — *higher shares shaded darker*						
Company	State(s) of operation	Main and line length (miles)	Cathodically protected steel (bare)	Cathodically protected steel (coated)	Iron*	Plastic	Unprotected steel (bare)	Unprotected steel (coated)	Others
West Texas Gas Inc.	LA, NM, OK, TX	5,943	1.85	13.50	0.00	81.88	1.87	0.88	0.00
Northwest Natural Gas Co.	OR, WA	24,264	0.00	37.42	0.00	62.57	0.00	0.00	0.00
New York State Electric & Gas Corp.	NY	8,452	0.06	30.60	0.07	64.72	1.25	2.48	0.79
Wisconsin Electric Power Co.	MI, WI	17,297	0.00	22.48	0.00	77.52	0.00	0.00	0.00
Rochester Gas and Electric Co.	NY	9,120	0.04	38.74	0.03	58.60	0.72	0.70	1.17
ENSTAR Natural Gas Co.	AK	6,098	0.02	8.40	0.00	87.10	0.00	0.00	4.49
New Mexico Gas Co. Inc.	NM	15,772	0.69	41.11	0.00	58.20	0.00	0.00	0.00
Wisconsin Gas LLC	WI	20,295	0.00	26.84	0.00	72.39	0.00	0.00	0.77
Puget Sound Energy Inc.	WA	26,307	0.00	22.78	0.00	77.22	0.00	0.00	0.00
Middle Tennessee Natural Gas Utility District	TN	7,032	0.00	19.70	0.00	80.30	0.00	0.00	0.00

Data compiled Aug. 19, 2021.
* Includes cast and ductile iron.
Analysis is limited to companies with at least 5,000 miles of distribution mains and service lines.
Service line length estimated from count of lines and average length.
Source: S&P Global Market Intelligence

Figure 2: S&P Global Market Intelligence.[120]

While S&P's analysis arose in the context of reporting on leak repairs, this data highlights how LDCs are differently situated in their ability to blend hydrogen in their existing pipeline systems due to the diversity of their systems in age, construction materials, length and other factors. It also points to one of the key variables an LDC will need to analyze when considering whether and to what extent it can incorporate hydrogen into its existing business model.

Another step that LDCs can take to analyze the potential impact of hydrogen blending on their systems is to engage in pilot or demonstration projects. Several LDCs in the U.S. and abroad have already begun engaging in such projects. For example, Southern California Gas Co. (SoCalGas) was reportedly among the first utilities to test hydrogen blending on both natural gas infrastructure and end-use equipment like stoves and home heating systems.[121] SoCalGas's preliminary results showed some household appliances could tolerate up to a 20% hydrogen blend.[122] Additionally, SoCalGas and other large California LDCs have been directed by the California Public Utilities Commission (CPUC) in a recent rulemaking to inaugurate additional pilot projects to study infrastructure limitations and

119. *Id.*

120. *Id*.

121. *SoCalGas Among First in the Nation to Test Hydrogen Blending in Real-World Infrastructure and Appliances in Closed Loop System*, HYDROGEN CENTRAL (Oct. 2, 2021), https://hydrogen-central.com/socalgas-test-hydrogen-blending-infrastructure/.

122. *Id.*

demonstrate the viability of hydrogen blending between 0.1% and 5% and between 5% and 20%.[123]

The results of these initiatives likely will be informative for other LDCs seeking to consider the practical implications of hydrogen blending and how to potentially structure a demonstration or pilot program for their own systems. The International Energy Agency (IEA) maintains a Clean Energy Demonstration Projects Database that maps major demonstration projects globally, which can serve as a valuable resource for LDCs considering how to structure such a project.[124]

B. Challenges with blending hydrogen into the LDC system

When discussing the use of hydrogen as a medium through which the LDC can decarbonize, practitioners generally refer to the concept of "blending" hydrogen into gas delivered to individual customer facilities (*i.e.*, industrial customers who require high heat processes) and separately blending into the natural gas distribution system. However, the LDC and their end-users must consider their own infrastructure and capabilities before leveraging a natural gas-hydrogen blend.

Infrastructure tolerances vary, and due to the case-by-case studies required, there is no definitive rule for blend tolerances. In theory, blending hydrogen into the natural gas distribution system for a utility is a way to replace energy sold to the customer via natural gas with hydrogen, which does not emit carbon dioxide when combusted.[125] Doing so will allow LDCs to move hydrogen without needing to fully replace the LDC's gas delivery system. There have been several studies indicating LDCs can safely blend anywhere from 5% to 20% hydrogen into the natural gas stream without needing to make significant upgrades to the system.[126] However, a recent study out of California suggests the actual blend threshold could be closer to 5% in that state's distribution system.[127] As blend thresholds exceed these limits, operational upgrades are needed in the system to safely deliver gas to customers.[128] Such upgrades will generally include significant upgrades to the

123. *Joint Application of Southern California Gas Company (U 904 G), San Diego Gas & Electric Company (U 902 G), and Southwest Gas Corporation (U 905 G) to Establish Hydrogen Blending Demonstration Projects*, PUB. UTIL. COMM'N OF THE STATE OF CALI., Case A.22-09-XXX (Sept. 8, 2022).

124. *Clean Energy Demonstration Projects Database*, INT'L ENERGY AGENCY, https://www.iea.org/data-and-statistics/data-tools/clean-energy-demonstration-projects-database (last modified Sept. 22, 2022). Notably, it appears that the database has not yet been updated to reflect that several projects are no longer "under construction" and are now in operation. *Id.* For example, Air Liquide's liquid hydrogen production and logistics infrastructure in North Las Vegas, Nevada, which is reported now in operation, provides hydrogen for fuel cell vehicles in California and is fully powered by renewable electricity. Eli Segall, *Energy giant opening $250M plant in North Las Vegas*, LAS VEGAS REVIEW-JOURNAL (May 14, 2022), https://www.reviewjournal.com/business/energy/energy-giant-opening-250m-plant-in-north-las-vegas-2576157/; *Air Liquide inaugurates in the U.S. its largest liquid hydrogen production facility in the world*, AIR LIQUIDE (May 23, 2022), https://usa.airliquide.com/air-liquide-inaugurates-us-its-largest-liquid-hydrogen-production-facility-world.

125. Miroslav Penchev et al., *Hydrogen Blending Impacts Study*, CAL. PUB. UTIL. COMM'N (2022), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF.

126. *See generally id.*; Melaina *et al.*, *supra* note 55, at vii.

127. Penchev et al., *supra* note 125.

128. *CPUC Issues Independent Study on Injecting Hydrogen Into Natural Gas Systems*, CAL. PUB. UTIL. COMM'N (July 21, 2022), https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-issues-independent-study-on-injecting-hydrogen-into-natural-gas-systems.

LDC's distribution system and each discrete home and business's gas delivery system within each building's walls.[129] There is no formal agreement on maximum blending percentage among utilities, and this variability can be seen across states.[130] Given the level of operational and technical data required to assess the viability of blending for a given pipeline system or large industrial customers, LDCs are among the stakeholders best positioned to lead the required technical and scientific inquiry.[131]

Another challenge is the difference in volumetric delivery requirements between natural gas and hydrogen. When blending percentages are mentioned, the percentage is generally given on a "volume" basis rather than an "energy" basis. In essence, if a customer is receiving 100 cubic feet of natural gas with no blend, the same customer would receive eighty cubic feet of natural gas and 20 cubic feet of hydrogen in a 20% blend scenario. Based on the lower volumetric energy density of hydrogen compared to natural gas, if a customer were to receive a 20% blend of hydrogen for 100 cubic feet of delivered gas, the total embedded energy within the delivery would be lower than if 100 cubic feet of natural gas had been delivered. This is demonstrated below in Figure 3.

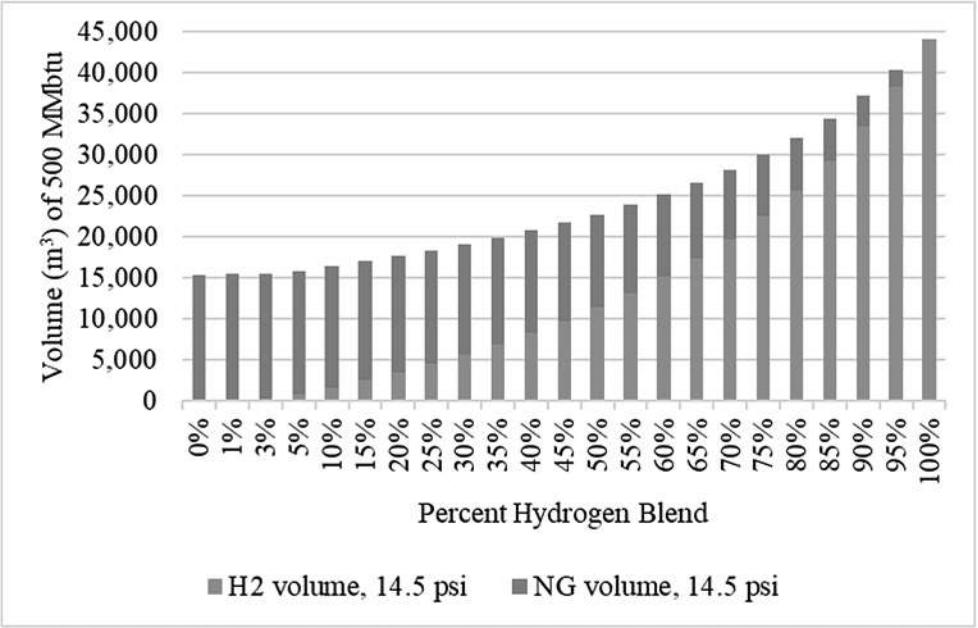

Figure 3. Volumetric Gaseous Requirement to Meet 500 MMBtu of Energy Demand, Source: Hernandez and Li Analysis

129. *Id.*
130. Murdoch et al., *supra* note 54, at 8.
131. *Id.*

Figure 3 shows the volumetric requirement if an LDC were to meet the same monthly energy demand for a given customer – in this illustrative example, the energy demand considered is 500 MMBtu at a pressure of 14.5 pounds per square inch (psi) and 15ºC.[132] As the hydrogen blend percentage increases, the actual volume required to meet the same energy demand grows non-linearly. In a situation where an LDC moves pure hydrogen on its system at 14.5 psi, it would ultimately need to sell approximately three times more physical gas to meet the same energy demand than if it were delivering strictly natural gas. This implies the LDC's customer would need to be prepared to accept three times more physical gas than it currently accepts to meet the same energy demand at that pressure. Further, the volume of hydrogen and natural gas will change based on the pressure of distribution lines because of hydrogen's lower energy density compared to natural gas. Again, it will be important for both the LDC and customer to understand infrastructure availability and tolerances before considering the use of hydrogen. Aside from the volumetric need for the LDC to upgrade its system to move hydrogen, each customer that currently consumes gas within a home or business may also need to reinvest in their gas delivery system and the appliances to accept a fuel with different chemical properties compared to natural gas.

In considering how to overcome some of the potential limitations on hydrogen blending, it is important to note that many of the studies on hydrogen blending presume that hydrogen will be blended into the gas network for delivery for all customers connected to that network. However, as observed in a Connecticut state report investigating the viability of hydrogen blending as an end-use, "[h]ydrogen blending for non-core customers (e.g., industrial or power generation customers) could be done at the facility level due to the large, concentrated demand for natural gas that exists at these facilities."[133] While such blending would still require an assessment of the customers' facility to determine whether hydrogen can be blended directly into their fuel feedstock without affecting operations, because the use case focuses on individual customer facilities it avoids the need to assess the impact of hydrogen blending on the wider distribution network.[134] Thus, the opportunities for hydrogen blending (as a percentage) may be greater for non-core customers.

C. Limitations of customers' end-use products

A significant limitation on the utility of hydrogen to serve customers' needs is the lack of end-use products that can operate on a high volume of hydrogen. Hydrogen is more flammable than natural gas and the risk for embrittlement of

132. At 360 psi and 15 ºC, the volumetric energy density of hydrogen is roughly 296 MJ/m3 and the volumetric energy density of natural gas roughly 907 MJ/m3 on a higher heating value basis. These base values were chosen based on average commercial usage per month and approximate value for backbone trunkline pressures. *See Number of Natural Gas Consumers,* U.S. ENERGY INFO. ADMIN., https://www.eia.gov/dnav/ng/ng_cons_num_a_EPG0_VP5_Mcf_a.htm.

133. CONN. GREEN BANK & STRATEGEN, CONNECTICUT HYDROGEN TASK FORCE STUDY: SUBMITTED TO THE ENERGY & TECHNOLOGY COMMITTEE OF THE CONNECTICUT GENERAL ASSEMBLY PER SPECIAL ACT 22-8 61 (2023), https://www.ctgreenbank.com/wp-content/uploads/2023/01/Connecticut-Hydrogen-Task-Force-Study-FINAL-20230114.pdf.

134. *Id.*

metal is higher.[135] Accordingly, household appliances such as stoves or HVAC systems that currently operate on natural gas cannot run on pure hydrogen and will need to be retrofitted or replaced.[136] Further, the blend threshold for such products will vary by appliance type and age. LDCs must study their own systems and consider how the potential incorporation of hydrogen in their distribution system will affect their customer-base.

There have been some advancements in developing end-use products that can run on higher percentages or pure hydrogen. For example, in 2019 BDR Thermea group installed the world's first hydrogen-powered domestic boiler in the Netherlands, which reportedly is still in "excellent condition, having operated continuously and without any issues or loss of capacity since installation."[137] A number of utilities, both in the U.S. and abroad, also are investigating the potential viability of integrating hydrogen into residential end-uses through the use of demonstration projects. In the UK, Northern Gas Networks has opened a number of hydrogen homes, which are fitted with hydrogen gas appliances, including stoves and boilers.[138] In California, SoCalGas is constructing what it calls the "[H2] Innovation Experience," which will be a modular home with solar panels, a battery system, and electrolyzer to convert solar energy to hydrogen and a fuel cell to supply electricity for the home.[139] SoCalGas also intends to blend hydrogen with natural gas to be used in the home's heat pump HVAC unit, water heater, clothes dryer, and gas stove.[140] Even if these demonstration projects prove fruitful, however, scaling up from a demonstration project to a system-wide blend of hydrogen and natural gas will be a significant undertaking.

D. Carbon-intensity of hydrogen production

While certain hydrogen end-uses do not emit carbon dioxide, combustion of hydrogen does emit nitrogen oxides (NOx). Additionally, emissions associated with producing hydrogen without carbon capture, sequestration, and storage (CCS) or other appropriate control devices are not negligible. In fact, depending on the production mode, the emissions associated with producing hydrogen can be quite significant.[141]

There are two primary modes through which hydrogen is produced in the United States: (i) steam methane reforming (sometimes referred to as a "gray hy-

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135. *Safe Use of Hydrogen*, U.S. OFF. OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, https://www.energy.gov/eere/fuelcells/safe-use-hydrogen.

136. Esposito, *supra* note 99.

137. *Three Years On, and the World's First 100% Hydrogen Boiler is Still Going Strong*, BDR THERMEA GROUP (Jan. 16, 2023), https://www.bdrthermeagroup.com/en/stories/hydrogen-boiler-is-still-going-strong.

138. *Our Hydrogen Home*, N. GAS NETWORKS, https://www.northerngasnetworks.co.uk/current-business-plan/our-hydrogen-home-welcome-to-green-gas/.

139. [H2] Innovation Experience: The Future of Renewable Energy is Here, SOCALGAS, https://www.socalgas.com/sustainability/h2home.

140. *Id.*

141. *See* Murdoch et al., *supra* note 54, at 51 (describing the health impacts associated with the production and end-use of hydrogen and stating that without emission control devices, steam methane reforming can produce carbon dioxide and other volatile organic compounds emissions and other "comorbidities").

drogen"); and (ii) electrolysis by splitting water into hydrogen and oxygen (sometimes referred to as "green hydrogen").[142] Excluding hydrogen produced as a by-product, industrial participants in the United States produce on the order of 10 million tons (MMT) of hydrogen today, effectively all via steam methane reforming.[143] The production of hydrogen via steam methane reforming emits on the order of nine kilograms (kg) of carbon dioxide per kilogram of hydrogen produced.[144] It is possible to incorporate CCS technologies to capture emissions released from this steam methane reforming process—in the U.S., such steam methane reforming units paired with CCS technologies are actively operating and others have been announced—which could reduce the emissions associated with producing such hydrogen (sometimes referred to as "blue hydrogen").[145] In 2022, such "blue hydrogen" accounted for less than 5% of production.[146] Even hydrogen produced via electrolysis may have potentially significant embedded carbon emissions.[147] If the electrolyzer is directly connected to a local power grid, the carbon intensity of the hydrogen produced will rely directly on the carbon intensity of the power grid within the region.[148]

Revisiting the example in section IV.B, if an LDC wanted to supply a customer with 500 MMBtu of energy at 14.5 psi, the emissions associated with producing hydrogen will be extremely sensitive to both the blend percentage of hydrogen and natural gas as well as the hydrogen production mode and location. Results from this illustrative example are shown below in Figure 4.

142. Mohit Joshi et al., HYDROGEN 101: FREQUENTLY ASKED QUESTIONS ABOUT HYDROGEN FOR DECARBONIZATION, GREENING THE GRID 2-3 (2022), https://www.nrel.gov/docs/fy22osti/82554.pdf. There has been movement away from utilizing colors to describe hydrogen based on its production method for a number of reasons, including the limiting nature of using such labels given the increasing number of technologies being used to produce hydrogen. Accordingly, this article endeavors to describe hydrogen based on the process used to create it rather than a color. However, for convenience and ease of understanding in an evolving discourse, this article continues to make use of colors in specific circumstances.

143. Elizabeth Connelly et al., CURRENT HYDROGEN MARKET SIZE: DOMESTIC AND GLOBAL, U.S. DEP'T OF ENERGY (Oct. 1, 2019), https://www.hydrogen.energy.gov/pdfs/19002-hydrogen-market-domestic-global.pdf.

144. Units converted from emissions rate of 0.8091 kg of carbon dioxide per cubic meter of hydrogen produced from steam methane reforming. INT'L ENERGY AGENCY GREENHOUSE GAS R&D PROGRAMME, IEAGHG TECHNICAL REPORT 16 (2017), https://ieaghg.org/exco_docs/2017-02.pdf. This value will vary based on the embedded emissions associated with leaks in the production and delivery of natural gas. Alan Krupnick & Aaron Bergman, INCENTIVES FOR CLEAN HYDROGEN PRODUCTION IN THE INFLATION REDUCTION ACT, RES. FOR THE FUTURE (Nov. 9, 2022), https://www.rff.org/publications/reports/incentives-for-clean-hydrogen-production-in-the-inflation-reduction-act/.

145. Port Arthur Fact Sheet: Carbon Dioxide Capture and Storage Project; Carbon Capture & Sequestration Technologies, MASS. INST. OF TECH. (2016), https://sequestration.mit.edu/tools/projects/port_arthur.html; see generally Louisiana Clean Energy Complex, AIR PRODUCTS, https://www.airproducts.com/campaigns/la-blue-hydrogen-project.

146. *See infra* note 168.

147. Krupnick & Bergman, *supra* note 144.

148. *Id.*

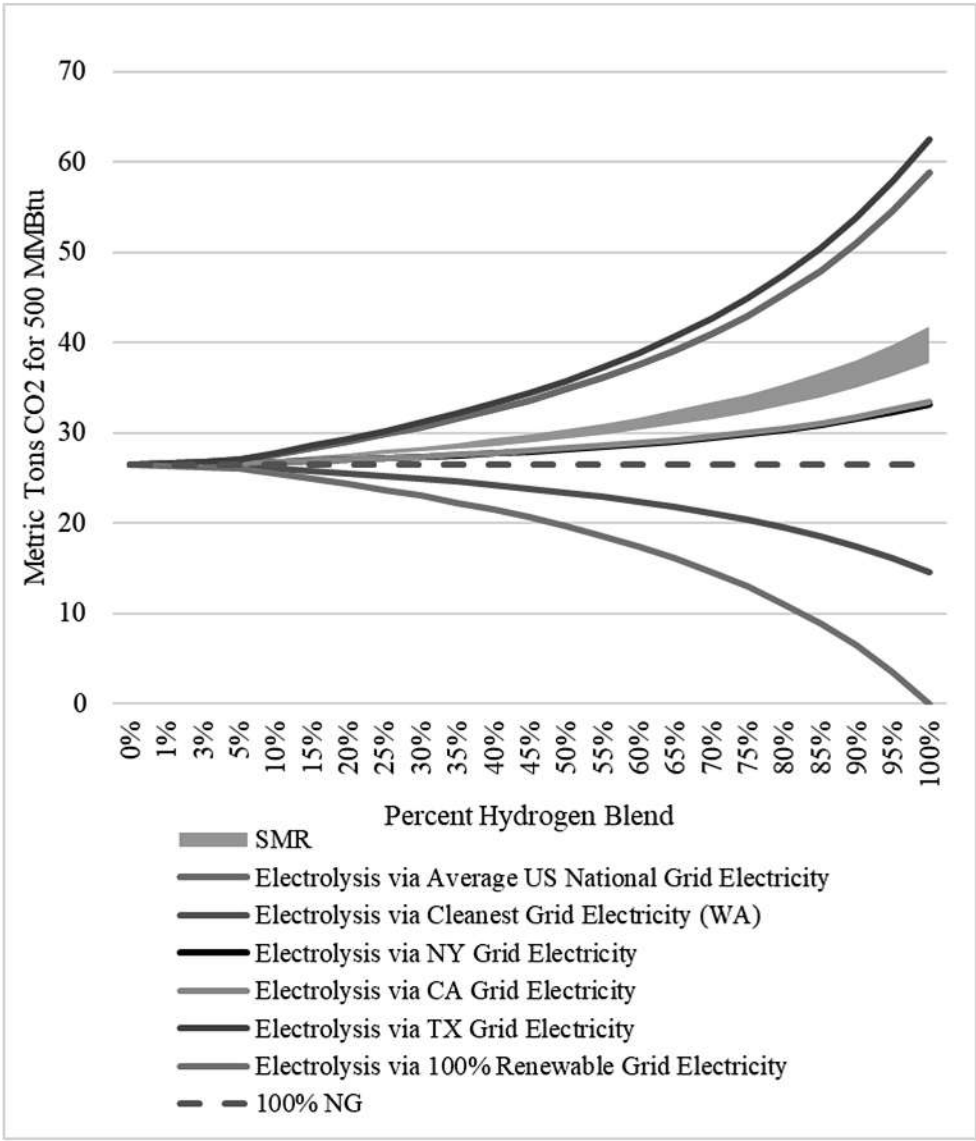

Figure 4. Carbon Intensity of Delivered Energy, Source: Hernandez and Li Analysis

It is worth noting that there are only two scenarios detailed above that ultimately emit less carbon dioxide than that of natural gas: (i) power sourced from the "cleanest" portion of the U.S. grid according to the U.S. Energy Information

Administration, which is in Washington state, where the primary source of electricity is hydroelectric production;[149] and (ii) hydrogen produced via electrolysis powered by 100% renewable energy.[150] For the sake of this analysis, the emissions in Figure 4 only represent emissions from the production of hydrogen.[151]

LDCs will need to be mindful of these varying emission rates when representing the potential benefits of hydrogen blending to both regulators and consumers. For example, it would be difficult for a utility to justify to a regulator the required infrastructure investment to move a blend of hydrogen and natural gas on the grounds of reducing emissions associated with LDCs' operations if there are no real emissions benefits. LDCs also will need to be aware of potential litigation and regulatory action that may arise if they make claims about environmental benefits from hydrogen blending that are not supported by the actual emissions data.

E. Cost of producing low-carbon hydrogen

Because LDCs pass on to ratepayers the costs of the commodities procured to serve such ratepayers, it is important for LDCs to consider the potential costs of hydrogen acquired to serve customers and potential ratepayer impacts.

The commodity cost of delivered gas on a dollar-per-unit energy basis is a function of the blend percentage of the fuel being delivered to customers.[152] Hydrogen is generally discussed on a dollar-per-unit mass ($/kg) basis.[153] Price targets for clean hydrogen are generally set on this basis as well.[154] For example, the U.S. Department of Energy, through its Hydrogen Earthshot Initiative, has a target of producing clean hydrogen at $1/kg by 2031.[155] In order to translate this cost to one easily compared with natural gas, the cost would need to be presented in a dollar-per-unit energy ($/MMBtu) basis.[156] This conversion can be made by multiplying the hydrogen cost by a range of roughly 7 to 9 depending on if a higher or lower heating value of for hydrogen is assumed. Table 1 below shows the price of hydrogen on both a $/kg and $/MMBtu basis, assuming a higher heating value.[157]

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149. *Washington Electricity Profile 2021*, U.S. ENERGY INFO. ADMIN. (Nov. 10, 2022), https://www.eia.gov/electricity/state/washington/. Emissions from electrolysis are calculated based on the annual emissions intensity of power produced in each respective state. This analysis is meant to be illustrative, as the embedded emissions associated with hydrogen production via electrolysis can vary based on a selected carbon dioxide accounting methodology.

150. *See* Figure 4.

151. *Id.*

152. *Gas Prices Explained*, AM. PETROLEUM INST., https://www.api.org/oil-and-natural-gas/energy-primers/gas-prices-explained.

153. *Hydrogen Shot*, U.S. OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/fuelcells/hydrogen-shot.

154. *Id.*

155. *Id.*

156. *Explore MMBTU*, ADANI GRP., https://www.adanigas.com/png-commercial/explore-mmbtu.

157. BRITISH PETROLEUM, APPROXIMATE CONVERSION FACTORS 2 (2021), https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-approximate-conversion-factors.pdf. The higher heating value of hydrogen yields a conversion rate of 7.44; in order to get the cost of hydrogen on a $/MMBtu basis, one must multiply the $/kg figure by 7.44. This figure is calculated by converting the higher heating value of hydrogen to a MMBtu/kg basis.

Table 1. Energy Equivalent Cost of Hydrogen on a $/kg and $/MMBtu Basis

$/kg	$/MMBtu
$ 1.00	$ 7.44
$ 2.00	$ 14.87
$ 3.00	$ 22.31
$ 4.00	$ 29.75
$ 5.00	$ 37.18

The actual delivered commodity cost, which is passed through directly to the customer, will vary considerably based on a number of variables: (i) the blend percentage; (ii) the price of natural gas; and (iii) the price of hydrogen. As an illustrative example, if we consider the same 500 MMBtu discussed prior delivered to the customer at 14.5 psi, the price of the delivered commodity will vary, as shown in Figure 5.

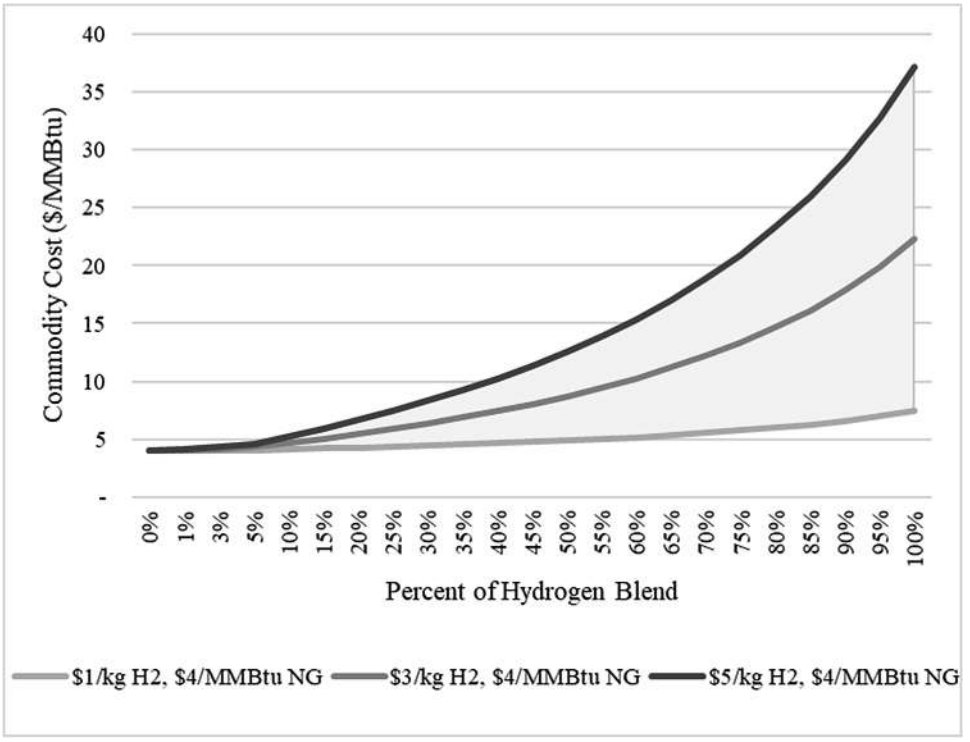

Figure 5. Commodity Cost of Gas Delivered to Customer, Source: Hernandez and Li Calculations

If one assumes a base natural gas price of $4/MMBtu and adjusts the hydrogen price between $1/kg and $5/kg, the commodity cost for the delivered gas can vary from $4/MMBtu in a 0% hydrogen blend scenario to $37.18/MMBtu in a 100% hydrogen blend, high-cost scenario. In other words, in the lowest cost hydrogen scenario, the commodity price for the delivered energy in a 100% hydrogen blend would be 1.85 times more expensive than directly delivering natural gas. In the worst case, the commodity cost would almost be ten times more expensive.

Note that this is only the commodity cost component of the ratepayer's bill. To safely move 100% hydrogen on the LDC's system, LDCs will need to make significant capital expenditures in their systems. These expenses would then be recovered by the utility with a return through the cost-of-service ratemaking process that was discussed in section II. In short, the cost of delivered gas to meet the same energy demand could be significantly more expensive in a world where the LDC is moving hydrogen versus a world where the LDC moves natural gas.

There are federal tax incentives that could drive down hydrogen commodity costs and increase project economic feasibility.[158] Producers of hydrogen with lifecycle greenhouse gas emissions less than 4 kg CO2/kg H2 can qualify for the production tax credit (PTC) set forth in section 45V of the Internal Revenue Code.[159] The ultimate tax credit value varies depending on the lifecycle greenhouse gas emissions associated with the hydrogen and can range from $0.6/kg to $3/kg of hydrogen.[160] Another tax credit is available under section 45Q of the Internal Revenue Code for CCS projects, though there may be certain limitations on claiming the 45V and 45Q credits on the same projects.[161] This credit may help decrease costs of hydrogen produced via steam methane reforming combined with CCS.[162] In addition to these federal incentives, state level incentives or regulations might decrease hydrogen production costs. For instance, California is pushing hydrogen demand as a transportation fuel through its Low Carbon Fuel Standard (LCFS) program.[163]

These incentives do not represent the entirety of funding and programs aimed at commercializing multiple segments of the hydrogen value chain; rather, these examples are meant to highlight just some of the federal and state-level government policy and programs available to hydrogen projects. Such federal and state incentives may be able to reduce the cost of hydrogen as a commodity and, therefore, the final delivered commodity cost of hydrogen for the end-use customer, ultimately determining if hydrogen is cost-competitive for gas blending. In states where there are no existing incentives, LDCs may consider advocating for the creation of such incentives.

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158. *Financial Incentives for Hydrogen and Fuel Cell Projects*, U.S. OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/fuelcells/financial-incentives-hydrogen-and-fuel-cell-projects.

159. BIPARTISAN POL'Y CTR., INFLATION REDUCTION ACT SUMMARY 3, https://www.energy.gov/sites/default/files/2022-10/IRA-Energy-Summary_web.pdf.

160. *Id*.

161. *Id*.

162. Krupnick & Bergman, *supra* note 144, at 15, 17, 26.

163. *Alternative Fuels Data Center: Hydrogen Laws and Incentives in California*, U.S. DEP'T OF ENERGY, https://afdc.energy.gov/fuels/laws/HY?state=CA.

F. Need for scale-up of domestic low-carbon hydrogen production

Another challenge to successfully integrating hydrogen into a decarbonization strategy is the need to scale up domestic production of low-carbon hydrogen.

Some estimates put the per annum requirements of a net-zero emissions steel industry alone—not including the hydrogen needed to decarbonize existing hydrogen demand or deploy as an energy storage vector—at over 50 MMT of green hydrogen globally.[164] However, in 2021, there was less than 1 MMT of low-emission hydrogen produced globally, most of which was produced from plants using fossil fuels fitted with CCS technologies.[165] The Department of Energy estimates that the U.S. produces 10 MMT per year of hydrogen, over 95% of which comes from steam-methane reformation, which is not considered to be a source of low-carbon hydrogen.[166] Globally, hydrogen "demand . . . is met almost entirely [with] hydrogen" produced from fossil fuels.[167] This is also true of hydrogen produced in the U.S., where reformation-based production without CCS accounted for roughly 95% of hydrogen production in 2022, and hydrogen produced with electrolysis powered by grid electricity accounted for less than 1%, with reformation paired with CCS making up the difference.[168]

The long road to scaling green hydrogen is especially apparent when viewed in the context of blending hydrogen into natural gas consumed by the residential, commercial, and industrial sectors in the United States. In 2022, these sectors consumed a combined 17 trillion cubic feet (Tcf) of natural gas.[169] Even a 5% volumetric blend of hydrogen into the natural gas demand within the sectors would require roughly 2 MMT of hydrogen to serve the same energy demand.[170] This is notable since, as discussed above, annually the entire U.S. market for intentionally produced hydrogen is 10 MMT, the overwhelming majority of which is produced through steam methane reforming rather than by electrolysis.[171]

This has significant implications for LDCs seeking to procure low-carbon hydrogen to serve customers. First, there will need to be a significant increase in low-carbon hydrogen production capacity to meet the needs of U.S. LDCs. Second, because there is no existing liquid market for low-carbon hydrogen in the

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164. *Decarbonising global iron ore and steel industry by 2050 necessitates urgent action and US$1.4 trillion of investment*, WOOD MACKENZIE (Sept. 15, 2022), https://www.woodmac.com/press-releases/decarbonising-global-iron-ore-and-steel-industry-by-2050-necessitates-urgent-action-and-us$1.4-trillion-of-investment/.

165. Julien Armijo et al., *Global Hydrogen Review*, INT'L ENERGY AGENCY 5 (2022), https://iea.blob.core.windows.net/assets/c5bc75b1-9e4d-460d-9056-6e8e626a11c4/GlobalHydrogenReview2022.pdf.

166. *See* Parfomak*, supra* note 117, at 4.

167. *See* Armijo et al.*, supra* note 165, at 71.

168. Murdoch et al., *supra* note 54, at 10.

169. *Natural Gas Consumption by End Use,* U.S. ENERGY INFO. ADMIN. , https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm.

170. This calculation makes the following simplifying assumptions: (1) the amount of hydrogen needed in a 5% blend by volume scenario is roughly 0.85 Tcf of hydrogen; and (2) the assumed density of hydrogen is roughly 0.09 kg/m^3. Based on these assumptions, the amount of hydrogen required to meet a 5% blend of annual natural gas consumption in the United States is roughly 2 MMT.

171. U.S. DEP'T OF ENERGY., DEPARTMENT OF ENERGY HYDROGEN PROGRAM PLAN (2020), https://www.hydrogen.energy.gov/pdfs/hydrogen-program-plan-2020.pdf.

U.S., LDCs likely will need to contract directly with producers of low-carbon hydrogen.

G. Competing, conventional technologies remain cheaper

Hydrogen, natural gas, oil, and propane leverage the combustion of the fuel to produce heat used to warm the environment. For electric power, heat can be produced either via a resistance heater, which converts electric power directly to heat, or a heat pump, which leverages electric power to move latent heat from a heat source (in the case of an air-source heat pump, the outdoor environment) to the indoor environment.[172] Heat pumps have the ability to heat and cool while using up to 70% less energy than compared to other technologies.[173] Based on the technology present in a heat pump, it is possible that the conversion from electric power to heat is more than 100% efficient.[174] These competing technologies will provide a challenge to using hydrogen as a heating fuel from both an operational and economic perspective.

As discussed previously, there are ample operational challenges associated with an LDC moving either a blend of hydrogen and natural gas, or pure hydrogen, on its existing gas distribution system.[175] Beyond the operational challenges associated with moving hydrogen, significant investment needs to be made beyond each individual customer's meter to ensure the customer's internal gas distribution system can move hydrogen. Moreover, the commodity cost for hydrogen will be much higher than that of natural gas.

Numerous academic and industry studies have evaluated the potential use of hydrogen for heating purposes. An assessment of over 30 studies focused on the issue of using hydrogen as a fuel for space and water heating came to the following key conclusions:

1. "Hydrogen for heating is associated with higher energy system costs when compared [against] alternatives";

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172. *Air-Source Heat Pumps*, U.S. DEP'T OF ENERGY, https://www.energy.gov/energysaver/air-source-heat-pumps.

173. Rachel Golden & Cara Bottorff, *New Analysis: Heat Pumps Slow Climate Change in Every Corner of the Country*, SIERRA CLUB (Apr. 23, 2020), https://www.sierraclub.org/articles/2020/04/new-analysis-heat-pumps-slow-climate-change-every-corner-country.

174. *How a Heat Pump Works*, INT'L ENERGY AGENCY, https://www.iea.org/reports/the-future-of-heat-pumps/how-a-heat-pump-works (explaining a heat pump is a tool that moves heat from a "source" to a "sink." In the context of an air-source heat pump, the technology pulls heat present in the outside environment and moves it to the inside environment (the sink)). However, there are numerous types of heat pumps, including ground-source, water-source, and heat pumps that leverage waste heat from nearby industrial processes. *Heat Pump Systems*, U.S. DEP'T OF ENERGY, https://www.energy.gov/energysaver/heat-pump-systems#:~:text=There%20are%20three%20main%20types,%2C%20water%20source%2C%20and%20geothermal. The efficiency of this process, while it can exceed 100%, will vary based on the latent heat available in the source. *Heat Pumps in Cold* Climate, BLOCPOWER, (Jan. 9, 2023), https://www.blocpower.io/posts/cold-climate-heat-pumps. For reference, the efficiency of an air-source heat pump degrades considerably as the outdoor temperature drops below freezing. *Id.* Heat pumps can also work in reverse, where latent heat in the "sink" is moved to the "source." *How a Heat Pump Works*, *supra* note 174. This operating mode leads to cooling of the "sink" by reducing heat within it. *Id.*

175. As of this writing, in the United States there are 1,600 miles of dedicated hydrogen pipelines while over 3 million miles of operational natural gas pipelines. Murdoch et al., *supra* note 54, at 14; Penchev et al., *supra* note 130, at 15.

2. "Hydrogen for heating results in higher costs [to the consumer]"; and

3. Using "hydrogen for heating" generally yields "more negative environmental impacts"[176]

Of course, the ultimate cost to an LDC's customer to meet a given heat load will vary depending on actual capital costs associated with installing the technology and the commodity cost associated with fueling the technology. However, LDCs must be aware of potential costs to their consumers as they pursue potential strategies within their system, and that the decarbonization of their system may lead their customers to defect to other sources of water and space heating if the costs of incorporating hydrogen are too high. At the same time, using hydrogen may be the only option for decarbonizing service for some large commercial customers where electrification is not practical to serve their end uses.

V. LEGAL CHALLENGES TO LDCS INTEGRATING HYDROGEN

One of the key challenges that will face many LDCs, as least initially, is the lack of legal and regulatory certainty with respect to whether LDCs may purchase, transport, and charge customers for the purchase of hydrogen. In many states, the relevant statutes and regulations specifically tie the definition of gas utility (or other applicable titles) to natural gas and are silent on the role of hydrogen, which may have significant implications for LDCs.[177]

Other authors have addressed the arguments regarding potential regulation of hydrogen transportation on the federal level and it is not an objective of this paper to replicate such analyses.[178] A similar comprehensive analysis and drawing generalized conclusions at the state level is more difficult because each state has its own unique regulatory regime.

At a high level, however, each state defines key terms such as "natural gas" and "utility" differently. In many states, the relevant statutes and regulations do not explicitly address hydrogen at all.[179] The lack of hydrogen's inclusion—or its implicit exclusion by being defined elsewhere—may create regulatory uncertainty for an LDC as to what extent such LDC will be able to rate base for hydrogen-related initiatives as it would with natural gas. If not affirmatively addressed and resolved, this ambiguity can give rise to litigation. This is playing out in one proceeding in California. In response to an application from SoCalGas to the CPUC for a memorandum account for its proposed hydrogen Angeles Link Project, one

176. Jan Rosenow, *Is heating homes with hydrogen all but a pipe dream? An evidence review*, REGUL. ASSISTANCE PROJECT (Sep. 27, 2022), https://www.cell.com/joule/fulltext/S2542-4351(22)00416-0.

177. In his article from last spring's edition of this journal, Will Bolgiano comprehensively addresses the arguments regarding federal regulation of transportation of hydrogen by interstate pipeline. *See* Bolgiano, *supra* note 12. Since that article was published, there have been two proposed amendments to major legislation that would have amended the NGA to incorporate hydrogen into the definition of natural gas. This would have unavoidable follow-on consequences for LDCs.

178. Bolgiano, *supra* note 12.

179. *Hydrogen Law, Regulations & Strategy in the US*, CMS, https://cms.law/en/int/expert-guides/cms-expert-guide-to-hydrogen/united-states-of-america.

party filed a protest arguing that such an account would be improper and the production or transmission of hydrogen should not be regulated as a public utility.[180] Notably, the blending of hydrogen into existing natural gas distribution is not an objective of the Angeles Link Project, which is instead being developed to deliver green hydrogen to end-users.[181]

This proceeding highlights the fact that LDCs will always need to thoroughly review the state statutes and regulations governing their service territory to identify potential ambiguities. Once such ambiguities have been identified, LDCs should consider beginning a dialogue with their regulators about adopting necessary changes. Given that LDCs must operate daily under such statutes and regulations administered by their regulators, LDCs are often among the stakeholders best positioned to help regulators identify and overcome potential regulatory hurdles.

In considering how to approach such a dialogue, it can be valuable to look at other states that are currently tackling such issues. Several jurisdictions are pushing forward efforts on both natural gas and hydrogen, all at different stages of regulatory study or implementation and all with nuanced policy goals. While these proceedings have varying policy goals, one common theme is how to define clean or green hydrogen in order to better demarcate the sector itself. California is fairly advanced in this process and has adopted an interim definition.[182] Other states are continuing to study their potential paths forward.[183]

LDCs and other interested stakeholders should therefore aim to track state regulatory developments as relevant to their particular service territory or region. These proceedings also offer an opportunity for LDCs and interested stakeholders to advocate for changes that will support utilization of hydrogen by LDCs. Further, as more proceedings run their course, increasing regulatory certainty will help crystalize the hydrogen value chain and solidify a framework for integrating hydrogen in an LDC's system.

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180. So. Cal. Gas Co., Protest of Air Products and Chemicals, Inc., Application No. 22-02-007, PUB. UTILS. COMM. OF THE STATE OF CAL. (filed Feb. 17, 2022), at 6, https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M460/K301/460301926.PDF (providing grounds for protest and arguing "[h]ydrogen has not traditionally been considered a 'gas' subject to regulation under the [California] Public Utilities Code"). This same party further argues: "California has led the nation in pursuing clean and renewable alternative fuels. As SoCalGas accurately observes hydrogen will play a significant role in decarbonization and combating climate change. The [CPUC] should not stifle innovation, competition, and private investment in this developing industry by subjecting it to regulation envisioned by one company, particularly where, as here, there are no captive customers in need of protection." *Id*. at 14-15.

181. *Id*. at 3, 5, 9.

182. *Clean Hydrogen Program*, CAL. ENERGY COMM., https://www.energy.ca.gov/programs-and-topics/programs/clean-hydrogen-program.

183. Connecticut Hydrogen Task Force Study: Submitted to the Energy & Technology Committee of the Connecticut General Assembly per Special Act, *supra* note 133, at 68-71 (exploring through a stakeholder process and examination of other jurisdictions how to define clean hydrogen, first summarizing the new federal rules before exploring similar definitions in Montana, Washington, Oregon and international jurisdictions for a total of 14 separate definitions of clean, renewable, or green hydrogen; many commenters expressed that any definition that Connecticut adopts should be consistent with federal definitions while others called for a higher standard, such as capturing only hydrogen produced with zero-carbon renewable energy).

VI. CONCLUSION

Just as there are no two identical LDCs, service territories, regulators, or customer bases, there is no single blueprint for how an LDC can best leverage hydrogen as part of a successful energy transition plan. Nonetheless, there are certain key steps that an LDC can take when considering how to integrate hydrogen into an energy transition strategy.

First, what is driving the LDC to develop a decarbonization strategy or consider incorporating hydrogen into its business model? If the initiative is in response to a specific regulatory directive, such as the gas transition and other proceedings described above, then the strategy must be designed to meet the objectives of that directive, which may leave less room for creativity in how to comply with any future emissions limits through planning processes even if the LDC is not legally bound to do so. On the other hand, if the initiative is driven by a commitment by the LDC itself, its parent company or investors, there may be more room for the company to think broadly in the formulation of its goals and the strategies it adopts to achieve those goals. Such drivers are not mutually exclusive.

Second, the LDC must analyze potential legal hurdles to incorporating hydrogen into its business model. It is unclear in some jurisdictions whether an LDC may purchase hydrogen or pass on the cost of hydrogen or infrastructure improvements associated with it to ratepayers. LDCs should work with their trade associations, legislators and regulators to revise the appropriate laws, rules, regulations, codes and standards simultaneously and at multiple levels of government to specifically address hydrogen in a coherent fashion.

Third, the LDC must analyze potential practical challenges to and limits on incorporating hydrogen into its system. This will require considering the composition of the LDC's existing system, as the system's age and existing materials may affect the level of hydrogen that can be blended. The composition of the LDC's existing customer base also may affect the degree to which hydrogen can be blended into the system. Moreover, until there is a significant scale-up of domestic, low-cost, low-carbon hydrogen production, the ability to access a consistent supply of low-carbon hydrogen also may be a challenge, especially in certain markets.

Finally, the LDC must do what LDCs have done for over a hundred years to serve their customers: they must plan, and they must act to implement such plans. This planning process will vary depending on the state. And while hydrogen will not be the right solution for all customers or all LDCs' systems generally, having reasons backed by principled analysis as to why an LDC does or does not pursue a particular plan to provide clean, reliable service will be important to regulators and, by extension, the public.

Once the LDC has developed its plan, hydrogen projects will need to be integrated into rate base, to the extent possible. Pilot projects also may be a valuable first step to demonstrate scalability. When an LDC pursues any decarbonization strategy, whether or not that strategy includes hydrogen, incorporating learnings from pilot projects can be a key ingredient in stakeholder advocacy.

Along the way, LDCs should leverage existing federal and state incentives. While LDCs may initially not be in the business of generating hydrogen, as required to qualify for the production tax credit for clean hydrogen under the Inflation Reduction Act, they can potentially benefit from these incentives by virtue of lower offtake costs.[184] In states where there are no incentives, LDCs can engage with legislators on a state level to adopt incentives to promote hydrogen deployment.

The default, however, cannot be inaction. LDCs risk diminishing customers and load as more states and customers explore transitioning away from widespread use of natural gas. This means that as LDCs simultaneously continue investing in their existing systems for safety and reliability reasons, they may also be recovering such costs from an ever-smaller customer base, leading to a combination of rising rates, increasing burden for ratepayers, and leading to potential under-recovery for LDCs.[185] And while hydrogen will not be a complete solution or fit into the decarbonization strategies of all LDCs, with appropriate planning LDCs can incorporate hydrogen into a larger strategy to successfully transition into a low-carbon future.

184. *See supra* notes 54, 158-162 and accompanying text (discussing these and other federal programs promoting clean hydrogen).

185. *Affordability and credit quality in the gas utility industry*, CHARLES RIVER ASSOCS. (Dec. 8, 2022), https://www.crai.com/insights-events/publications/affordability-and-credit-quality-in-the-gas-utility-industry.

CARBON CAPTURE AND SEQUESTRATION – "ESSENTIAL," BUT TOO LITTLE, TOO LATE?

By David C. Smith[*]

Synopsis: Carbon dioxide removal (CDR), including carbon capture and sequestration, was once derided as little more than a corporate ploy to prolong reliance on fossil fuels. But CDR is now recognized by leading global authorities as essential to any effort to accomplish Paris Agreement objectives. Notwithstanding this recognition, many authorities caution that the world may be too late to sufficiently scale and deploy CDR strategies at the magnitude necessary for the existing challenge to reduce carbon emissions necessary to avoid irreversible climate impacts, and they could be correct. This article assesses these claims; puts in context the magnitude of CDR climate advocates argue is necessary relative to its current utilization; the existing regulatory, economic, and political barriers and incentives to broad-scale CDR viability and deployment; and recommends strategies to accomplish the necessary ramp-up. While such scaling is unlikely to be feasible within the timeline urged by Paris, CDR represents a vital step in the overall effort to mitigate the worst impacts of climate change.

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I. INTRODUCTION

The Intergovernmental Panel on Climate Change (IPCC) and the California Air Resources Board (CARB) are now reiterating what climate research has demonstrated for decades: Greenhouse gas emissions are not falling fast enough to prevent catastrophic climate impacts. Despite ambitious and increasing emission reduction targets and pledges globally, the world is far off track from meeting the objectives of the Paris Agreement (i.e., limiting global temperature increase to no more than 2.0°C and, ideally, 1.5°C).[1] Accordingly, climate authorities worldwide assert that carbon dioxide remove (CDR) strategies must be part of the global effort.

This article presents and examines the following issues:

1. the widely accepted contention that CDR is now "essential;"

2. whether the world is already "too late" to effectively deploy CDR strategies according to timelines set forth by Paris;

3. if the scaling of operating CDR technologies necessary by mid-century to avert irreversible climate impacts is possible[2];

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1. Simon Evans, *Direct CO2 capture machines could use 'a Quarter of Global Energy' in 2100*, CARBONBRIEF (Jul. 22, 2019, 10:00 AM), https://www.carbonbrief.org/direct-co2-capture-machines-could-use-quarter-global-energy-in-2100/ ("The 2015 Paris Agreement set a goal of limiting human-caused warming to 'well below' 2C and an ambition of staying below 1.5C. Meeting this ambition will require the use of 'negative emissions technologies to remove excess CO2 from the atmosphere, according to the (IPCC)."). *See* Corbin Hiar, *Exxon CEO says carbon removal is climate cure with oil perks*, CLIMATEWIRE (Jun. 28, 2022, 6:48 AM), https://subscriber.politicopro.com/article/eenews/2022/06/28/exxon-ceo-says-carbon-removal-can-save-oil-industry-00042607.

2. GLOB. CCS INST., GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO 2, 4 (2022) https://www.globalccsinstitute.com/wp-content/uploads/2023/01/Global-Status-of-CCS-2021-Global-CCS-Institute-1121-1-1.pdf ("[T]here remains a massive gap between today's CCS fleet and what is required to reduce global anthropogenic emissions to net zero. Limiting global warming to 2°C requires installed CCS capacity to

4. the existing regulatory, economic, and political barriers and incentives to broad scale CDR viability and deployment; and

5. recommendations to accomplish an unprecedented ramp-up of CDR technologies to facilitate them serving their newly proclaimed essential role in meeting Paris objectives.

Deploying CDR technologies at the scope and scale necessary to meet the carbon reduction targets of the Paris Agreement is likely impossible. Yet, even without meeting Paris' timeline, CDR technologies constitute an essential component of ongoing carbon reduction because of the continued magnitude of both ongoing global emission levels as well as legacy emissions already in the atmosphere.[3] Without meaningful CDR operating to reduce CO_2 emissions, climate research indicates catastrophic tipping points may be in store for human civilization.[4]

Many of the examples, analyses, and regulatory structures highlighted in this article come from California. The state has been among the most aggressive jurisdictions in the world in setting climate and emission reduction targets. California has held itself to exacting monitoring and reporting regimes. Still, recent inventories show California, like most U.S. jurisdictions, is far from being on track to hit its aggressive targets.[5] The state's regulatory blueprint to accomplish economy-wide carbon reduction targets recently underwent a public and contentious comprehensive update and adoption by CARB.[6] California Governor Gavin Newsom recently proposed and pressed through the legislature arguably the most aggressive statutory package of climate laws proposed in the U.S. While California illustrates many issues raised in this article, the dynamics, barriers, incentives, and proposed policy solutions are offered for universal application.

The second section of this article examines the contention that CDR is essential to meeting Paris' carbon reduction objectives and suggestions that the world may already be "too late" to deploy CDR technologies at a scope and scale sufficient to meet the goal.[7]

The third section defines CDR in its various iterations – natural and mechanical – focusing on three specific CDR approaches: carbon capture and sequestration (CCS); carbon capture, utilization, and sequestration (CCUS); and direct air capture (DAC). It will also address the metric of "carbon neutrality" where the amount of CDR required is measured relative to the imbalance between new emissions and carbon absorption through natural processes, the incorporation of CDR

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increase from around 40Mtpa today to over 5,600 Mtpa by 2050. Between USD$655 billion and USD$1,280 billion in capital investment is needed by 2050.").

3. *Id.* at 2.

4. *Id.* at 2.

5. Nadia Lopez, *Slashing greenhouse gases: California revises climate change* strategy, CALMATTERS (Nov. 16, 2022), https://calmatters.org/environment/2022/11/california-revises-climate-change-plan/.

6. CAL. AIR RESOURCES BD., 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY (2022), https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp.pdf.

7. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 2. "Large infrastructure projects like CCS facilities or pipeline networks usually take seven to 10 years from concept study through feasibility to design, construction then operation. There is no time to waste." *Id.* at 12.

being necessary to remove emissions in excess of natural absorption to bring the total to at least "net zero," or zero new emissions added.[8]

The fourth section looks at the economics of CDR. More specifically, assessing the economic viability of CDR through government subsidy[9] or utilization of CDR for expanded fossil fuel production and profit,[10] a highly contentious and even politically fatal proposition that can doom CDR projects. As discussed later in this article, the Petra Nova CDR "success story" underscores the challenges of making CDR economically viable in the short-term.

The fifth section examines regulatory permitting required for any CDR project and how that process likely inhibits if not precludes timely establishment of CDR operations.

The sixth and final section offers recommendations to attempt to confront the contention and likely resignation that we are, in fact, too late to deploy CDR at the scale and on timeframes necessary to accomplish Paris carbon-reduction objectives. However, it is imperative to recognize that "too late" with regard to Paris does not mean the world can now abandon the deployment of CDR at the scale to which it is now recognized as essential to avoid catastrophic tipping points.

II. CARBON DIOXIDE REMOVAL: "ESSENTIAL" BUT "TOO LATE"?

A. Carbon Dioxide Removal Is "Essential"

Carbon emissions policy has shifted focus towards carbon removal as a means to mitigate climate change. What was once derided by environmental advocates as a ploy to enable prolonged reliance on fossil fuel use[11] is now widely recognized as imperative to accomplishing not only "carbon neutrality," but "carbon negativity" required to address legacy emissions and achieve Paris Agreement targets. Likewise, the IPCC stated in its Sixth Assessment Report (AR6) that reliance on CDR is "unavoidable if net zero CO_2 or GHG emissions are to be

8. "The amount of carbon removal that will be required depends on how quickly companies and governments can slash emissions from oil and gas and other sources." Hiar, *supra* note 1.

9. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 12. "Creating an enabling environment for investment in CCS facilities and other net zero aligned assets – particularly in supporting infrastructure – through both policy and funding, should be a high priority for governments between now and 2030." *Id.* "The global CCS industry must grow by more than a factor of 100 by the year 2050, to achieve Paris Agreement climate targets." *Id.* at 11.

10. Tony Briscoe*, California hopes to fight global warming by pumping CO_2 underground. Some call it a ruse,* L.A. TIMES (July 25, 2022), https://www.latimes.com/environment/story/2022-07-25/is-carbon-capture-and-storage-a-cover-for-oil-production; *see* 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY, *supra* note 6. "As is the case with CCS, mechanical CDR technologies will need government or other incentive support to get over technology and market barriers." *Id.* at 93.

11. 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY, *supra* note 6. "Over the past decade I have seen CCS move from being falsely identified only as a coal fired power generation technology to being increasingly embraced as a vital element of meeting the climate challenge due to its versatility of application, demonstrated effectiveness and ability to deal with enormous volumes of emissions." GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 3.

achieved."[12] "Fourteen countries . . . had CCS in their Nationally Determined Contributions ("NDCs") [under the Paris Agreement] as of July 2021."[13] The U.S. Department of Energy (DOE) noted that "CCS and carbon removal are both 'crucial and necessary' to meet the country's climate ambitions."[14] At the same time, CARB released a draft update to the "Scoping Plan," California's aforementioned blueprint for achieving its economy-wide emission reduction goals, and declared CCS "a necessary tool to reduce GHG emissions and mitigate climate change. . . ."[15]

Research institutes and think tanks affirm the imperative of CDR in accomplishing Paris objectives. The Global CCS Institute wrote that "CCS is a necessary element of the technology suite that must be deployed if the world is to achieve the Paris Objectives,"[16] and that

> [w]e know based on reputable analysis, including from the IPCC, that carbon dioxide removal will be required to meet the Paris targets. We also know that nature-based solutions alone will not be enough. . . . It is also increasingly apparent that direct air capture will need to play a significant role.[17]

Even as the calls for CDR deployment have strengthened and spread, the challenges of deployment have become more apparent:

> As impressive as the past year's progress with accelerating the CCS project pipeline is, the stark reality is that enormously more CCS facilities are required – at least a 100-fold increase over the 27 in operation today – by 2050. Without this, the world is extremely unlikely to achieve the key targets in the Paris Agreement with the well documented serious consequences of such an outcome.[18]

Bridging the gap between CDR deployment and capacity is the remaining focus of this article.

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12. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2022 MITIGATION OF CLIMATE CHANGE 36 (2022), https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf.

13. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 22.

14. Corbin Hiar & Carlos Anchondo, *Biggest CCS failure clouds Supreme Court ruling,* E&E NEWS (July 11, 2022), https://www.eenews.net/articles/biggest-ccs-failure-clouds-supreme-court-ruling/. "'DOE will continue to focus on developing carbon management technologies that can be applied to both power generation and industrial sources of CO_2, as well as to capturing and removing CO_2 directly from ambient air,' the DOE spokesperson said." *Id.*

15. 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY, *supra* note 6, at 84. "Now, as California attempts to meet ambitious climate goals, environmental officials are embracing carbon capture and storage, saying the state cannot achieve carbon neutrality without it." Briscoe, *supra* note 10. On December 15, 2022, CARB adopted the final version of the 2022 Scoping Plan, largely unchanged from the Draft Scoping Plan cited herein. *CARB approves unprecedented climate action plan to shift world's 4th largest economy from fossil fuels to clean and renewable energy*, CAL. AIR RES. BD. (Dec. 15, 2022), https://ww2.arb.ca.gov/news/carb-approves-unprecedented-climate-action-plan-shift-worlds-4th-largest-economy-fossil-fuels.

16. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 2.

17. *Id.*

18. *Id.*

B. Are We "Too Late"?

The cost and magnitude of expansion of CDR necessary to meet Paris objectives may be infeasible within the agreement's timeline. The current operating assumption is that technologies for both CCS and DAC work.[19] Yet the scale of current deployment of these technologies is a fraction of what would be required for CDR to have a chance to meet carbon reduction targets in Paris. CARB staff, among others, are sounding the alarm:

> State, national, and global decarbonization analyses indicate a significant role for carbon management infrastructure, yet relatively few projects are operational. Future research, development and demonstration projects must refine and commercialize capture systems for more complex applications, especially those with limited decarbonization options. It has only been in the last few years that attention has seriously turned to mechanical CDR. As new information and modeling on climate change have been made available, the science has become clearer that avoiding the most catastrophic impacts of climate change requires both reducing emissions and deploying CDR.[20]

The estimates of the magnitude of CDR deployment required in the second half of this century are staggering:

The IPCC also estimated that 5-10 gigatonnes (Gt)[21] of carbon dioxide (CO_2) must be removed from the atmosphere each year in the second half of this century to:

- offset residual emissions that are very difficult to abate,
- hard to avoid emissions such as those from agriculture and air travel, and
- reduce the total load of greenhouse gases in the atmosphere to below the carbon budget for 1.5°C of global warming correcting for the overshoot.[22]

Experts have expressed concern about the economic costs to execute rapid transition to a renewable energy-based system.[23] But CDR could extend the transition time for the switch to a 100% zero-carbon system. Among other things, this affords states added compliance flexibility with renewable portfolio and clean energy standards.

However, one expert projects that the necessary "huge pace and scale" of increased CDR utilization are "expansion of up to 30% each year and deployment

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19. Andrew Moseman & Howard Herzog, *How efficient is carbon capture and storage?*, MIT CLIMATE PORTAL (Feb. 23. 2021), https://climate.mit.edu/ask-mit/how-efficient-carbon-capture-and-storage#:~:text=CCS%20projects%20typically%20target%2090,will%20be%20captured%20and%20stored.

20. 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY, *supra* note 6, at 220-21.

21. One gigaton is 1,000,000,000 tons. *Gigatonne*, ENERGY EDUCATION, https://energyeducation.ca/encyclopedia/. For purely illustrative purposes, one gigaton is roughly the equivalent of "200 million elephants, enough elephants to stretch from the Earth to the moon." *Id.* Other rough equivalents of a single gigaton include "5.5 million blue whales, 3 million Boeing 747 jets, [and] 2 million international space stations." *Id.*

22. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 10.

23. Evans, *supra* note 1. "[D]espite 'huge uncertainty' around the cost of DAC, [a] study suggests its use could allow early cuts in global greenhouse gas emissions to be somewhat delayed, 'significantly reducing the climate policy costs' to meet stringent temperature limits." *Id.*

reaching 30 [gigatons of CO_2 per year] towards the end of the century."[24] Some openly question the feasibility of such a ramp-up, with the only comparable effort being the unprecedented, government-driven evolution and maturation of the solar photovoltaic industry.[25]

"Reaching 30Gt CO_2/yr of CO_2 capture – a similar scale to current global emissions – would mean building some 30,000 large-scale DAC factories . . . [f]or comparison, there are fewer than 10,000 coal-fired power stations in the world today."[26]

A commonly referenced estimate is that CDR deployment would need to "grow by more than a factor of 100 by year 2050 to achieve Paris Agreement climate targets."[27]

With these stakes established, the remainder of this article explores the various forms of CDR, highlights both incentives and barriers to its meaningful deployment, recognizes cautionary proclamations over undue reliance on CDR technologies yet to be proven at the necessary scale, and offers recommendations for scaling up deployment as soon as possible setting aside Paris timeframes.

III. FORMS OF CARBON DIOXIDE REMOVAL

A. Carbon Dioxide Removal, Generally – Mechanical v. Natural/Biological

Carbon dioxide removal refers to extraction of CO_2 from the air, whether residual legacy gases in ambient air or newly produced emissions.[28] This process of removal can be natural by operation of the earth's carbon cycle (e.g., trees absorbing CO_2) or by human-initiated mechanical intervention.[29] The focus of this article is mechanical CDR – deployment of technologies that capture and concentrate ambient CO_2, whether from an industrial production stream or in the atmosphere.[30]

B. Forms of Mechanical CDR: CCS, CCUS, and DAC

Under the umbrella term of mechanical CDR, this article examines three specific approaches: CCS, CCUS, and DAC. "[Mechanical carbon removal] is not a new concept or technology."[31] "Twenty years of CCS testing shows it is a safe and reliable tool. . . . Moreover, there has been a U.S. Department of Energy CCS

24. *Id*.

25. *Id.* "Is the rate of scale-up even feasible? Typical rules of thumb are increase by an order of magnitude per decade [growth of around 25-30% per year]. [Solar] PV scale-up was higher than this, but mostly due to government incentives . . . rather than technology advances." *Id.*

26. *Id*.

27. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 11.

28. 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY, *supra* note 6, at 216.

29. *Id.* at 200.

30. *Id.* at 92, 245.

31. *Id.* at 221.

research program under way for more than two decades. These all form a foundation of information for future efforts."[32]

1. Carbon Capture and Sequestration

Carbon capture and sequestration, the most prevalent type of CDR,

> is a process by which large amounts of CO_2 are captured, compressed, transported, and sequestered. CCS projects are paired with a source of emissions as the CCS project captures CO_2 as it leaves a facility's smokestack. CCS projects are often paired with large GHG-emitting facilities such as energy, manufacturing, or fuel production facilities.[33]

Concentrated (often liquified) CO_2 is injected into geologic formations such as depleted fossil fuel reservoirs or saline formations deep underground where it cannot escape or leak back into the atmosphere.[34]

According to the Global CCS Institute, there are 27 operational CCS projects worldwide.[35] "This technology can be built on time and on budget [to recover its costs via tax incentives and other compensation for sequestered quantities of carbon], which kind of distinguishes it from other technologies around fossil fuels that are trying to reduce [the] carbon footprint of those fuels."[36] The Global CCS Institute is, by its own characterization, a think tank whose "diverse international membership includes governments, global corporations, private companies, research bodies and non-governmental organizations; all of whom are committed to CCS as an integral part of a net-zero emissions future."[37] Other CDR stakeholders would likely have differing perspectives than the institute on many issues.[38]

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32. 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY, *supra* note 6, at 221.

33. *Id*. at 84; *see* BATTELLE MEM'L INST., MONETIZING YOUR CARBON EMISSIONS WITH 45Q TAX CREDITS (2021), https://www.battelle.org/success/white-papers/monetizing-carbon-emissions.

34. MONETIZING YOUR CARBON EMISSIONS WITH 45Q TAX CREDITS, *supra* note 33. "For geologic storage, CO_2 is injected into a deep geological formation where it can be safely and permanently stored. These formations are typically deeper than 2650 feet to maintain the CO_2 in a supercritical state. Supercritical CO_2 is best because the CO_2 has the viscosity of a gas for easy injection and a liquid-like density for more efficient storage. The deep formation must have sufficient ability to allow the CO_2 to enter the formation (permeability) and sufficient space to store the CO_2 (porosity). Above the storage formation, there must be an impermeable caprock layer that prevents the stored CO2 form leaking out. Deep saline reservoirs and depleted oil and gas reservoirs are good candidates for CCUS projects. These formations can be found in sedimentary basins throughout the United States." *Id.*

35. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 3; Anne C. Mulkern, *Calif. may rely on carbon capture to meet 2045 net-zero goal*, CLIMATEWIRE (Jun. 30, 2022), https://subscriber.politicopro.com/article/eenews/2022/06/30/calif-may-rely-on-carbon-capture-to-meet-2045-net-zero-goal-1-00042920.

36. Hiar & Anchondo, *supra* note 14.

37. *About Us*, GLOB. CCS INST., https://www.globalccsinstitute.com/about/; *see Our Members*, GLOB. CCS INST., https://www.globalccsinstitute.com/membership/our-members/ (list of Global CCS Institute members).

38. Nicholas Kusnetz, *Carbon Capture Takes Center Stage, But Is Its Promise an Illusion?*, INSIDE CLIMATE NEWS (Mar. 9, 2022), https://insideclimatenews.org/news/09032022/carbon-capture-and-storage-fossil-fuels-climate-change/.

2. Carbon Capture, Utilization, and Sequestration

It is not uncommon for analyses to use the acronyms CCS and CCUS interchangeably, but the distinction is important and even essential in many political contexts. The "u" stands for "utilization."[39] To what use or purpose is the operator of the CCS facility putting the concentrated carbon? When the "u" is included, the carbon is utilized for the additional production of fossil fuels from a resource that was at or was nearing the end of its useful production life.[40] Termed "enhanced oil recovery" or "EOR," the sequestration injection process is into a depleted underground oil and gas reservoir to stimulate additional production that may not have been possible absent the pressurization caused in the newly injected carbon stream.[41] Aside from such utilization, or not, there is no difference between CCS and CCUS; the process of capture and concentration are the same.[42] The only question is where the captured carbon goes and for what purpose.

In some jurisdictions, however, the prospect of using CCS for enhanced and prolonged fossil production spells political doom for CCS. In California, for example, while state authorities recognize oil production and refinement cannot be phased out completely and that CCS is needed to help meet climate goals, a group of prominent environmental and environmental justice groups protested a legislative proposal by Governor Newsom to streamline permitting of CCS facilities if any use of CCS served to prolong the phase out of all fossil fuel production in the state.[43] Governor Newsom's legislative package ultimately included and the legislature adopted an express ban on CCS for EOR in California.[44] But California

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39. *What is Carbon Capture and Storage? – CCS Explained*, NAT'L GRID GROUP PLC, https://www.nationalgrid.com/stories/energy-explained/what-is-ccs-how-does-it-work#:~:text=As%20well%20as%20CCS%2C%20there,%2C%20plastics%2C%20concrete%20or%20biofuel.

40. *Carbon Capture, Utilisation and Storage*, INT'L ENERGY AGENCY, https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage (last updated Oct. 17, 2022).

41. Christophe McGlade, *Can CO2-EOR really provide carbon-negative oil?*, INT'L ENERGY AGENCY (Apr. 11, 2019), https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage; *About CCUS*, INT'L ENERGY AGENCY (Apr. 2021), https://www.iea.org/reports/about-ccus (noting use of CCUS for EOR is not new). Use of CCUS for EOR is not new: "[s]ome of these facilities have been operating since the 1970s and 1980s, when natural gas processing plants in the Val Verde area of Texas began supplying CO2 to local oil producers for enhanced oil recovery operations." *Id.*

42. Eva Amsen, *CCS and CCU. Mind explaining what these are again?*, NESTE (Apr. 21, 2021), https://journeytozerostories.neste.com/circular-economy/ccs-and-ccu-mind-explaining-what-these-are-again#a4c4fad1.

43. Curt Barry, *Newsom Faces Battle as He Urges Lawmakers to Toughen Climate Goals*, INSIDE EPA'S CLIMATE EXTRA (Aug. 12, 2022), https://insideepa.com/climate-news/newsom-faces-battle-he-urges-lawmakers-toughen-climate-goals. Out of approximately six CCS projects proposed for California's Central Valley – the main region in the state considered to have appropriate geologic sequestration reservoirs – only one proposes utilization of the carbon for EOR. *EPA Urged to Reject Carbon Capture Projects in Central California*, CTR. FOR BIOLOGICAL DIVERSITY (June 29, 2022), https://biologicaldiversity.org/w/news/press-releases/epa-urged-to-reject-carbon-capture-projects-in-central-california-2022-06-29/. California Resources Corporation proposes to capture 1.5 million tons of CO_2 each year and use it to stimulate production in its Elk Hills oil field to produce 51 million more barrels of oil over two decades. MONETIZING YOUR CARBON EMISSIONS WITH 45Q TAX CREDITS, *supra* note 33.

44. CAL. PUB. RES. CODE § 3132 (West 2022) (stating "an operator shall not inject a concentrated carbon dioxide fluid produced by a carbon dioxide capture project" or carbon dioxide capture and "sequestration project

is not the norm. Of 12 large-scale carbon storage facilities in the United States, 11 use captured carbon for oil production.[45]

3. Direct Air Capture

Utilizing the same underlying technology—carbon removal and concentration via various alternative chemicals' absorption and adsorption process with varying efficiency levels -- as CCS, DAC removes existing CO_2 from the atmosphere and concentrates it for sequestration or use.[46] Thus, DAC, unlike CCS, is not tied or bound to an industrial source of carbon.[47] The technology relies on "fans, filters, and pipes to remove carbon dioxide from the [ambient air], condense the gas into a liquid," and sequester it permanently.[48] Unlike CCS, therefore, DAC potentially can eliminate the need to transport sequestered carbon since the DAC facility is situated on or in immediate proximity to a sequestration facility.[49]

Direct air capture exemplifies CDR approaches proven technologically feasible but only at a minor fraction of what will be required.[50] Currently, the most robust operating DAC facility removes less than 1% of the carbon emitted by a single coal-fired power plant.[51] And, the cost of such scaled-up efficiency and deployment remains unknown and a significant factor of concern, although EPA has appropriated $3.7 billion dollars for the future establishment of four demonstration DAC regional hubs.[52]

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into a Class II well for purposes of enhanced oil recovery, including the facilitation of enhanced oil recovery from another well"). "Newsom officials are acknowledging concerns among some Democratic lawmakers, environmentalists and equity groups about CCUS by adding that 'the state must avoid projects that worsen climate change. Specifically, this proposal would prohibit an operator from using concentrated carbon fluids for purposes of enhanced oil recovery.'" Barry, *supra* note 43.

45. Briscoe, *supra* note 10; *see* Angela C. Jones & Ashley J. Lawson, CARBON CAPTURE AND SEQUESTRATION (CSS) IN THE UNITED STATES, CONG. RSCH SERV. (Oct. 5, 2022), https://crsreports.congress.gov/product/pdf/R/R44902 (stating "most projects use the injected CO2 to increase oil production from aging oil fields, known as enhanced oil recovery (EOR), while some facilities capture and inject CO2 with the aim to sequester the CO2 in underground geologic formations").

46. Sara Budinis, *Direct Air Capture*, INT'L ENERGY AGENCY (Sept. 2022), https://www.iea.org/reports/direct-air-capture.

47. Hiar, *supra* note 1.

48. *Id.*

49. Malin Edvardsson, *CCS, BECCS and DAC – What is the Difference?*, BIOLIN SCIENTIFIC (Mar. 10, 2020), https://www.biolinscientific.com/blog/what-is-the-difference-between-ccs-beccs-and-dac.

50. Hiar, *supra* note 1.

51. *Id.* ("[T]he largest existing facility can only remove 4,000 metric tons of carbon per year, less than 1 percent of the annual emissions of a single coal-fired power plant. Nevertheless, climate scientists believe the world needs to significantly expand its carbon removal capacity to have a shot at avoiding the collapse of coral reef ecosystems, widespread extreme heat waves and other impacts associated with warming of more than 1.5 degrees Celsius above preindustrial levels. The amount of carbon removal that will be required depends on how quickly companies and governments can slash emissions from oil and gas and other sources.").

52. *Biden-Harris Administration Announces $3.7 Billion to Kick-Start America's Carbon Dioxide Removal Industry*, DEP'T OF ENERGY (Dec. 13, 2022), https://www.energy.gov/articles/biden-harris-administration-announces-37-billion-kick-start-americas-carbon-dioxide; *see* Dr. Jennifer Wilcox, DIRECT AIR CAPTURE, DEP'T OF ENERGY (May 25, 2022), https://www.eesi.org/files/Jennifer_Wilcox_Slides_052522.pdf.

Experts caution against undue reliance on DAC, noting its high cost and unproven delivery at the scope and scale projected by California and others.[53] A particular line of climate research warns of "mitigation deterrence" arising from DAC reliance.[54] Characterizing direct emission reductions as "mitigation" against climate change, researchers refer to reliance on DAC as "mitigation deterrence" or the diluting of incentives to cut fossil fuel use today.[55] "Heavy reliance on negative emissions is problematic because the feasibility of large-scale CDR is highly uncertain. The promise of carbon removal could be used to delay or deter action in the present, but it could then fail to show up at scale when needed."[56]

California regulators are signaling that the state will be relying heavily on DAC in the second half of this century. Some have recognized that the state may have been overly optimistic in its projections for the time it will take for carbon removal technologies to become scalable and deployable.[57] Accordingly, California's environmental agencies have had to significantly revise their modeling.[58] The state nonetheless projects that one-third of their total emissions reductions will come from DAC in 2050 and beyond.[59]

C. "Net-Zero" Emissions

Removing carbon from industrial emission streams and the atmosphere itself accelerates emission reductions to accomplish "net-zero" or even negative levels of carbon contributions by combining emission reduction regimes with CDR efforts. Initially, progress towards emission reduction targets were gauged by quantitive numerics.[60] For example, the Executive Order by California Governor Arnold Schwarzenegger in 2005,[61] widely regarded as one of the first authoritative

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53. ENERGY AND ENVIRONMENTAL ECONOMICS, CPUC IRP ZERO-CARBON TECHNOLOGY ASSESSMENT 59, 67 (2022), https://www.ethree.com/wp-content/uploads/2023/03/CPUC-IRP-Zero-Carbon-Technology-Assessment.pdf.

54. Neil Grant & Dr. Ajay Gambhir, *Guest post: emissions should fall 'twice as fast' in case negative emissions fail,* CARBONBRIEF (Jun. 28, 2021), https://www.carbonbrief.org/guest-post-emissions-should-fall-twice-as-fast-in-case-negative-emissions-fail/.

55. *Id.*

56. *Id.*

57. CAL. AIR RESOURCES BD., DRAFT 2022 SCOPING PLAN (2022), https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf ("While the modeling [for the Scoping Plan alternatives] included CCS as being available in the first half of this decade, implementation barriers now indicate that is unlikely, and those emissions will be emitted into the atmosphere. For the Final 2022 Scoping Plan, the modeling will reflect updated assumptions for the earlier deployment of CCS for any sector in California.").

58. *Id.*

59. Mulkern, *supra* note 35. "About one-third of emissions reductions in 2045 would come from greenhouse gas removal techniques," under a proposed plan from staff at the California Air Resources Board. *Id.* The CEO of Exxon Mobil, Darren Woods, referred to DAC as the "holy grail," but noted concerns. Hiar, *supra* note 1. "If you can overcome some of those technology hurdles, get your costs down, you've got technology then that can address this in a very cost-efficient way." *Id.*

60. THE GREENHOUSE GAS PROTOCOL, A CORPORATE ACCOUNTING AND REPORTING STANDARD 54, https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf.

61. State of California Executive Order S-3-05 (Jun. 1, 2005), https://www.library.ca.gov/wp-content/uploads/GovernmentPublications/executive-order-proclamation/5129-5130.pdf.

enactments on climate,[62] called for California to reduce its greenhouse gas emissions to 1990 levels by 2020, 40% below 1990 levels by 2030, and 80% below 1990 levels by 2050.[63] Strict numerics: it is based on a calculated estimate of emission levels in 1990 as a baseline and specific, successive percentage reductions therefrom by dates certain.[64]

But it is much more common now to have climate authorities such as the IPCC and CARB speak in terms of "carbon neutrality" and "net-zero emissions," allowing for additional flexibility for the deployment of different technological solutions while addressing system reliability needs.[65] Roughly speaking, these terms target the point at which ongoing emissions are equivalent to or less than capture and sequestration processes.[66] These qualitative terms are tied to quantitative values – ultimately, zero – but the respective variables in "netting out" to zero are defined by the respective jurisdiction. For example, if DAC was sufficiently scaled, emission reductions could be zero if the DAC operation removed at least as much carbon as is emitted in a given time frame.[67] "CCS often emerges as an essential part of the lowest cost pathway to net zero."[68] Together, CCS and DAC enable surpassing carbon neutrality and, at least in theory, achieve carbon negativity by capturing legacy emissions already in the atmosphere. It is now widely accepted that accomplishing the Paris Agreement objectives will necessitate reliance on carbon removal for carbon emissions negativity.[69]

The tension between these quantification approaches surfaced in the 2022 California legislative session. One proposed law called for California to be carbon

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62. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 10. "The International Energy Agency (IEA) reports that, by late April 2021, 44 countries and the European Union had announced net zero emissions targets. . . . These commitments cover approximately 70 percent of global CO_2 emissions." *Id.*

63. State of California Executive Order S-3-05, *supra* note 61.

64. The California Legislature codified the 2020 and 2030 standards in 2006. *See AB 32 Global Warming Solutions Act of 2006*, CAL. AIR RESOURCES BD., https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006.

65. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 173. "In line with [the AR6] report, the Draft 2022 Scoping Plan considers carbon dioxide removal (CDR) as a complement to technologically feasible and cost-effective GHG emissions mitigation, and the size of its role will depend on the degree of success in reducing GHG emissions at the source across the economy. The modeling shows that emissions from the [California economy-wide] sources will continue to persist even if all fossil related combustion emissions are phased out. These residual emissions must be compensated for to achieve carbon neutrality. Options for CDR include both sequestration in natural and working lands and mechanical approaches like direct air capture." *Id.*

66. *Id.* "(C)arbon neutrality is achieved when the flux of GHGs from the sources equal the sinks." *Id.* at 21.

67. INT'L ENERGY AGENCY, A NEW ERA FOR CCUS (2020), https://iea.blob.core.windows.net/assets/181b48b4-323f-454d-96fb-0bb1889d96a9/CCUS_in_clean_energy_transitions.pdf.

68. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 11.

69. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 74 ("Ultimately, the role for mechanical CDR will depend on the success of reducing emissions directly at the source in the [California economy-wide] sectors and the ability of the [natural landscapes] to sequester carbon. However, mechanical CDR also provides an opportunity to not just achieve carbon neutrality, but also remove legacy GHG emissions from the atmosphere. As such, increased deployment of DAC can help achieve net negative emissions.").

neutral no later than 2045.[70] Another bill proposed to increase California's statutory goal for 2030 emissions reductions from 40% below 1990 levels to 55%.[71] The first bill passed; the second one failed.[72] While that may seem inconsistent, the reason is simple: even the most devout climate hawks in California do not see a viable path to hitting 40% reductions below 1990 emission levels by 2030, let alone 55%.[73] The 2030 standard is a strict quantitative measurement of verifiable emissions reductions; the 2045 qualitative "neutrality" standard allows any deficiency in emissions reductions to be offset by carbon removal strategies.[74] Audits of California's emission reduction progress shows real emission cuts are woefully deficient relative to reduction targets.[75] Fearing the aforementioned "mitigation deterrence" effect of reliance on CDR, climate advocates in California insisted that codification of the 2045 "neutrality" standard be paired with a companion goal of 85% emissions reductions from 1990 levels by the same deadline.[76] While accepting some level of flexibility inherent in a "neutrality" metric, this combination ensures that a minimum level of emission reduction occurs in reaching neutrality by the target end date.[77] Applying these same dynamics generally, the question becomes whether the global community can and will bring carbon removal technologies online in an economically viable and scalable way sufficient to generate meaningful reductions needed due to insufficient direct emissions decreases necessary for the Paris Agreement objectives.

D. Hard-to-Abate Industry Emissions

Greenhouse gas emission reductions and CDR are an economy-wide imperative; the issue is not limited to the energy sector. Policy debates concerning CCS and DAC tend to address the fossil fuel industry and whether removing carbon

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70. Stephanie Elam, *California regulators approve plan to achieve carbon neutrality by 2045*, CNN (Dec. 16, 2022), https://www.cnn.com/2022/12/16/us/california-carbon-neutrality-plan2045/index.html#:~:text=California%20regulators%20approve%20plan%20to%20achieve%20carbon%20neutrality%20by%202045,-By%20Stephanie%20Elam&text=California's%20air%20regulators%20approved%20an,Gavin%20Newsom%20earlier%20this%20year.

71. LATHAM & WATKINS, CALIFORNIA LEGISLATURE PASSES FOUR AGGRESSIVE CLIMATE BILLS AND AUTHORIZES EXTENSION OF DIABLO CANYON (2022), https://www.lw.com/admin/upload/SiteAttachments/Alert%203007.v2.pdf.

72. Zach Bright, *Newsom Scores Climate Agenda Wins as Legislature Wraps*, BLOOMBERG (Aug. 31, 2022), https://news.bloomberglaw.com/environment-and-energy/newsoms-climate-agenda-moves-toward-passage-as-legislature-ends.

73. Barry, *supra* note 43 ("CARB officials have repeatedly said that achieving the current 40 percent target will be extremely difficult and require more than doubling annual GHG reductions through 2030.").

74. *Id.*

75. Emily Hoeven, *California's Climate Goals Likely Out of Reach,* CALMATTERS (Feb. 24, 2021), https://calmatters.org/newsletters/whatmatters/2021/02/californias-climate-goals-unlikely/. "While California's vibrant clean energy economy is supporting strong job numbers, it is failing to deliver the necessary annual emissions reductions, as slowing renewable energy growth, underwhelming transportation sector gains, and a worrisome cross-sector over-dependence on natural gas pose major challenges for the state." *2021 California Green Innovation Index*, NEXT 10 (Dec. 14, 2021), https://www.next10.org/publications/2021-gii.

76. CAL. HEALTH AND SAFETY CODE § 38562.2 (West 2022).

77. *Id.*

from production and post-combustion emissions fosters perpetuation of environmental harms from fossil generation and slows the transition to renewable sources.[78] Yet, in terms of accomplishing net-zero and carbon-neutral objectives by 2050 or earlier, regulators are directing greater scrutiny on 'hard-to-abate' industries such as cement, steel, and glass production.[79] The issue for such sectors is that their product manufacturing process require such intense heat production that there are few or no known alternatives to the burning of fossil fuels.[80]

"There are fewer commercially available and economically viable electrification options to replace industrial processes that require higher-temperature heat. For these processes, onsite combustion may continue to be needed, and decarbonization will require fuel substitution to hydrogen, biomethane, or other low-carbon fuels."[81] Cement production poses particularly vexing challenges to reducing emissions.[82]

In defending the inclusion of CCS and DAC in the latest draft version of California's Scoping Plan, staff for CARB unapologetically noted that CDR technologies will be essential for these industries in reaching California's objective of carbon neutrality no later than 2045.[83] A DAC startup CEO characterizes the use of DAC as to such industries aptly: "DAC and other negative emissions technologies are the right solution once the cost and feasibility becomes too great . . . I see us as the backstop for challenging abatement."[84]

E. Unsettled Legal Issues

Several recurring unsettled legal questions arise in siting and approving CDR projects. These include what constitutes "permanent" sequestration of carbon, confirming a legal ownership interest in the space proposed to hold the carbon, and unifying multiple overlying surface ownership rights, among others. Such

78. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 3, 11, 55.

79. *See generally* GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2. "Increasingly, the focus for the application of CCS is in the industrial or 'difficult to decarbonize" sectors. For the most part CCS is the 'go-to- solution where electrification is not a viable solution, often when high heat or chemical reactions dependent on the presence of carbon are required." *Id.* at 2.

80. *Id.*

81. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 167 (citing Griffiths et al., *Industrial decarbonization via hydrogen: A critical and systematic review of developments, socio-technical systems and policy options* ENERGY RSCH. & SOC. SCI. (2021), https://doi.org/10.1016/j.erss.2021.102208).

82. *Id.* at 68. "Cement plants have emissions associated with combustion and process-related activities. Combustion emissions account for approximately 40 percent of the total emissions at the cement plants. The remaining emissions are related to process-related activities. Due to the high heat content needed to produce cement, there is currently no feasible alternative to combustion." *Id.*

83. Mulkern, *supra* note 35. "CCS is a must for certain types of businesses, Rajinder Sahota, CARB's deputy executive officer for climate change and research, said at the meeting Friday." *Id.* "[C]arbon capture and use/sequestration will be a likely component of any strategy to fully decarbonize cement manufacturing." DRAFT 2022 SCOPING PLAN, *supra* note 57, at 209. "While the state plan suggests CCS will account for only a small portion of greenhouse gas reductions, the Air Resources Board says it is essential to curtail emissions in such processes as cement manufacturing – operations that cannot be electrified and powered by renewable energy." Briscoe, *supra* note 10.

84. Evans, *supra* note 1.

issues represent recurring property rights and safety issues regardless of the respective local or state jurisdiction within which they may arise.

1. Defining "Permanent" Sequestration

"Permanent" sequestration of carbon represents one such issue. What constitutes "permanence" for geologic sequestration purposes, who is responsible for the sequestration facility and its integrity, and what financial security is required relative to maintaining the facility on a permanent basis? The term is not uniformly accepted. For example, an applicant for the universally required Class VI underground injection control permit from EPA necessary to inject and sequester carbon geologically must demonstrate the 'permanent ability' of the sequestration field to contain the injected carbon for 50 years.[85] But if that same facility is to qualify for credit under California's Low Carbon Fuel Standard (LCFS), it must demonstrate permanence relative to a 100-year timeframe.[86]

The issue of "permanence" arose legislatively in California in 2022 in several contexts including the integrity of the sequestration facility, monitoring/reporting obligations, and financial security duration.[87] While early drafts of various legislative vehicles imposed such obligations "in perpetuity," industry objection and proposals for a finite timeframe resulted in a compromise legislative directive for a time period to be determined by the appropriate oversight agency that is not less than 100 years.[88]

2. Legal Ownership of "Pore Space" Sequestration Area

Another unsettled area that routinely arises is the definition and distinct legal ownership of the subterranean formation into which the carbon will be injected, commonly known as "pore space."[89] While "surface rights" and "mineral rights"

85. ENV'T PROTECTION AGENCY, GEOLOGIC SEQUESTRATION OF CARBON DIOXIDE, UNDERGROUND INJECTION CONTROL (UIC) PROGRAM CLASS VI WELL PLUGGING, POST-INJECTION SITE CARE, AND SITE CLOSURE GUIDANCE ii, 32 (2016), https://www.epa.gov/sites/default/files/2016-12/documents/wp-pisc-sc_guidance_final_december_clean.pdf.

86. *California Low Carbon Fuel Standard*, INT'L ENERGY AGENCY, (Oct. 12, 2021), https://www.iea.org/policies/11671-california-low-carbon-fuel-standard ("Direct air capture facilities do not need to be located in the State to generate credits – they can be anywhere in the world – but must comply with the CCS Protocol, including monitoring of CO2 storage for up to 100 years.").

87. CAL. HEALTH AND SAFETY CODE § 39741 (West 2022); CAL. PUB. RES. CODE §§ 2213, 3132 (West 2022).

88. CAL. PUB. RES. CODE § 71464 (West 2022) (relating to ensuring drilling in and around the sequestration field will not result in release of the sequestered carbon). "Show proof to the state board that there is binding agreement among relevant parties that drilling or extraction that may penetrate the geologic storage reservoir are prohibited to ensure public and environmental health and safety for a period of time that is sufficiently long enough to demonstrate that the risk of carbon dioxide leakage poses no material threat to public health, safety, and the environment and to achievement of net zero greenhouse gas emissions in California and that terminates no earlier than 100 years after the last date of injection of carbon dioxide into a geologic storage reservoir." *Id.*

89. Curt Barry, *California Lawmakers Gut Bill Backed by Labor, Industry to Bolster CCUS*, INSIDE EPA'S CLIMATE EXTRA (June 24, 2022), https://insideepa.com/climate-news/california-lawmakers-gut-bill-backed-labor-industry-bolster-ccus (quoting California State Senator Caballero "Ultimately, we need to come to some

are long recognized and severable property interests, there is no bright line legal recognition of pore space nor the ability to independently own it as a severable land interest.[90] Recognition of and the alienability of pore space was included in early drafts of California Governor Newsom's late session proposal, but never made it into final legislation.[91] In fact, the final legislation states that a severance of "mineral rights" from "surface rights" does not convey a proposed "sequestration reservoir" unless the severance document expressly so states.[92] Resolution of ownership in this newly designated and discrete property interest will be essential to providing certainty to operators of sequestration fields to ensure no competing property interests may contest the legal authority to geologically sequester the carbon.

3. "Unitization" of Conflicting Overlying Surface Ownership Rights

Additionally, even though one landowner may want to establish an injection facility under his or her real property, the subterranean field may extend underground with multiple overlying land interests. "Unitization" refers to the ability to secure the right to the entire sequestration field, even if not all landowners will support its establishment.[93] Legislative proposals have called for procedures to compel but compensate hold-out surface owners when a defined critical mass of property owners approve of the project proposal.[94]

IV. ECONOMIC VIABILITY AND FINANCING OF CDR

A. There Is No Commercial Justification for Carbon Removal

Absent regulatory mandate, public finance subsidies, or additional EOR-driven operational revenues, according to authorities, there is no incentive for private operators to capture and sequester carbon.[95] And yet, the imperative of CCS and DAC to meet the objectives of the Paris Agreement, according to authorities

conclusion about pore space…"). "This proposal also defines subsurface pore space ownership and outlines pore space ownership options for purposes of geologic carbon sequestration projects." Barry, *supra* note 43.

90. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 177-78 (strategizing to achieve success was "[clarifying] pore space ownership and pore space utilization rules and processes as they apply to geologic carbon sequestration.").

91. CAL. PUB. RES. CODE § 71462 (West 2022).

92. *Id.*

93. The term "unitization" has long been employed in the oil and gas sector, designed to increase efficiency of extraction operations. In this context, it would similarly increase efficiency for sequestration injection operations.

94. CAL. PUB. RES. CODE § 71461 (West 2022) (calling for a framework by the Secretary of the Natural Resources Agency allowing three-fourths of interest holders to force unitization of an entire sequestration reservoir).

95. Briscoe, *supra* note 10 ("'There is no commercial value to sticking CO_2 into the ground,' [a CCS policy analyst] said. The only value comes from avoiding penalties or fees, or the tax incentives that are designed to do that. But those are public policy incentives. There's no private commercial rationale to do it.").

such as the IPCC and CARB are undeniable.[96] According to at least one estimate, "[l]imiting global warming to 2°C requires installed [global] CCS capacity to increase from around 40Mtpa today to over 5,600 Mtpa by 2050. Between USD$655 billion and USD$1,280 billion in capital investment is needed by 2050."[97] In other words, the current scale of CCS operations much increase by 140 times by 2050 at the noted cost estimates.

The equipment necessary to capture carbon and compress it, as well as the infrastructure or equipment to transport it, are expensive.[98] "'Currently, there are only two pathways to finance such an undertaking [of the necessary capture, transportation, and sequestration infrastructure]: massive government subsidies or allowing private industry to fund these projects by linking them to oil wells that will produce crude.'"[99] The one domestic CCS facility with documented performance successes relied on both heavy government subsidy as well as EOR revenues.[100] And yet, as discussed below, it has gone dormant with no indication of re-commencing operations.

1. The One and Only U.S. "Success" Story: Petra Nova

The domestic CCS "success story" to which everyone points actually casts a cloud of doubt over the commercial viability of CCS. Petra Nova was a $1 billion project constituting the world's biggest post-combustion capture system.[101] Construction began in 2014, and it started operations in late 2016 after significant backing from the DOE.[102] But it stopped operating less than four years later, its operator, NRG Energy Inc., blaming economic volatility in the wake of the COVID-19 pandemic.[103]

Petra Nova captured carbon from some of the emissions of a 610 MW coal-fired plant outside of Houston.[104] In its first years of operation, Petra Nova captured 92.4% of the carbon from emissions processed.[105] According to DOE, in all it captured more than 3.5 million metric tons of carbon dioxide, the equivalent of annual emissions from nine natural gas-fired plants.[106] The concentrated carbon

96. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 20 ("International climate agencies, like the IPCC, agree that a transition to a net zero economy will require a large scale-up of CCS facilities. Consequently, financing CCS is a critical component of emissions reductions.").

97. *Id.* at 12.

98. Briscoe, *supra* note 10 ("One of the main challenges to ramping up production has been the cost of equipment needed to capture and pressurize carbon dioxide, as well as the logistical hurdle of transporting the material to a storage site. The virtually liquified gas can be conveyed either through pipelines or via trucks or train.").

99. *Id.* "As is the case with CCS, mechanical CDR technologies will need government or other incentive support to get over technology and market barriers." *See* DRAFT 2022 SCOPING PLAN, *supra* note 57, at 73-74.

100. Hiar, *supra* note 1.

101. *Id.*

102. *Id.*

103. Hiar & Anchondo, *supra* note 14.

104. *Id*.

105. *Id.*

106. *Id.*

stream was shipped almost 100 miles away, where it was pumped underground for EOR.[107] But in May 2020, the company shut down Petra Nova citing negative oil prices.[108] But even with global economic conditions rebounding, Petra Nova's CCS operations have not come back online, even though the companion coal and natural gas plants have remained operational, notwithstanding the noted 92.4% carbon removal efficiency, highly touted by DOE[109] NRG has no plans at this time to re-commence operations at Petra Nova.[110]

B. Department of Energy Demonstration Grants

The Petra Nova saga illustrates the complicated economics and politics of CCS. Instrumental to Petra Nova's launch was a $195 million DOE grant, announced with great fanfare by Obama Energy Secretary Steven Chiu in 2010.[111] And lawmakers have since enacted many measures designed to facilitate more widespread use of CCS on fossil fueled generation units and industrial facilities.[112]

The DOE is very proactive in highlighting its aggressive push for demonstration projects for CDR. The Bipartisan Infrastructure Law provided $3.5 billion for a series of CCS demonstration projects and an additional $3.5 billion for the development of four large-scale DAC hubs in specified regions.[113] Of particular note, DOE publicly vets its efforts to make these demonstration projects a reality, currently investing in four front-end engineering design studies exploring existing sources of clean heat for DAC: nuclear, geothermal, and industrial waste heat.[114] The locations of the four DAC hubs have yet to be identified.

C. Federal and State Tax Credit Incentives

Tax incentives at both the federal and state levels are the most incentive-based government catalysts to encourage expedited investment in and maturation

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107. Hair & Anchondo, *supra* note 14. "'The reviled CO_2 is being captured and put to use doing what Texans know best how to do, and that is to produce even more energy from our oil fields,' Texas Gov. Greg Abbott (R) said during the project's opening ceremony." *Id.*

108. *Id.* ("Then in May 2020, NRG quietly shutdown the Petra Nova project. The company later suggested the decision to place the system in reserve status was prompted by the pandemic-induced drop in the oil price, which had briefly gone negative for the first time in history.").

109. *Id.*

110. *Id.* "'Options are being explored for improving the economics to allow for restart of the facility,' spokesperson Ann Duhon said in an email. 'Although oil prices have rebounded from where they were when the facility was mothballed, there is a long lead time to restart the carbon capture facility and it is not economic to operate for short periods based solely on fluctuations in oil prices." *Id.*

111. Hiar & Anchondo, *supra* note 14.

112. *Id.*

113. *Biden-Harris Administration Announces $3.7 Billion to Kick-Start America's Carbon Dioxide Removal Industry*, *supra* note 53. "In the United States, the U.S. Department of Energy announced financing specifically for DAC in March 2020 and March 2021. Additionally, almost $9 billion in CCS support was included in the USD 1 trillion Infrastructure Investment and Jobs Act passed by the Senate in August 2021. This includes funding to establish DAC hubs." DRAFT 2022 SCOPING PLAN, *supra* note 57, at 73-74.

114. Wilcox, *supra* note 52.

of CDR technologies and implementation strategies.[115] This is true notwithstanding previously haphazard renewal and extension of credits by lawmakers and calls for greater values and flexibility for credits. The most common and widely utilized incentive for CDR and a universally recognized prerequisite for CDR project viability is the federal 45Q tax credit.[116] The credit provides a monetary value for each metric ton of CO_2 injected into the ground,[117] either through sequestration alone or for EOR.[118] Initially implemented in 2008, uncertainty over the period of time that the credit would be available as well as concern with the adequacy of the amount of the credit have been a constant focus of industry lobbyists with Congress.[119] President Trump signed the Bipartisan Budget Act of 2018 that increased the amount of the 45Q credit from $20 to $50 per metric ton for geologically sequestered carbon and from $10 to $35 per metric ton for carbon utilized for EOR.[120] At the end of the Trump Administration, 45Q was extended for an additional two years.[121] At that time, to qualify for 45Q, construction of the new capture facility had to begin before January 1, 2026.[122]

The Inflation Reduction Act of 2022[123] (IRA or Act) is the strongest affirmation and expansion of the CCS 45Q credit to date. First and foremost, the Act responds to a long-time call from industry to increase the credit for sequestered CO_2 from $50 per metric ton to $85 per metric ton.[124] If the carbon stream is for EOR, the amount is $65 per metric ton[125] and if the carbon stream being sequestered is from DAC technology, the per metric ton credit may be as high as $180.[126] These maximum amounts for all categories are contingent upon compliance with

115. Hiar & Anchondo, *supra* note 14.

116. *Id.*

117. *Id*. "As of November 2019, more than half of the global large-scale CCS facilities (representing approximately 22 MMT CO_2/yr in capacity) were in the U.S., mostly as a result of sustained government support for the technologies. This support includes the federal 45Q tax credit for CCS and research and deployment grants from federal agencies." DRAFT 2022 SCOPING PLAN, *supra* note 57, at 67.

118. Hiar, *supra* note 1. "45Q is a section of the tax code that provides incentives, in the form of tax credits, to encourage companies to invest in carbon capture and storage solutions that reduce carbon emissions to the atmosphere. To qualify for tax credits, captured CO_2 must be either stored underground in secure geologic formations, used for CO_2-enhanced oil recovery (CO_2-EOR), or utilized in other projects that permanently sequester CO_2." MONETIZING YOUR CARBON EMISSIONS WITH 45Q TAX CREDITS, *supra* note 33.

119. Michael Rodgers, *US tax credit encourages investment in carbon capture and storage*, WHITE & CASE (Jan. 29 2021), https://www.whitecase.com/insight-our-thinking/us-tax-credit-encourages-investment-carbon-capture-and-storage.

120. *Id.*

121. *Id.*

122. *Id.*

123. Inflation Reduction Act of 2022 § 13104, 26 U.S.C. 45Q (2022).

124. *Id*. *See* Alejandro De La Garza, *The Inflation Reduction Act Includes a Bonanza for the Carbon Capture Industry*, TIME (Aug. 11, 2022), https://time.com/6205570/inflation-reduction-act-carbon-capture/. If the project is financed with tax-exempt bonds, there will be a deduction of the credit up to 15%, brought down from 50% under existing law. Molly F. Sherlock et al., *Tax Provisions in the Inflation Reduction Act of 2022(H.R. 5376)*, CONG. RES. SERV. (Aug. 10, 2022), https://crsreports.congress.gov/product/pdf/R/R47202.

125. Inflation Reduction Act of 2022 § 13104, 26 U.S.C. 45Q.

126. *Id.*

specified prevailing wage levels and programs for organized labor apprenticeship.[127] (Such requirements are not a factor on permitting of facilities, but rather affect the value of the tax credit for each unit of carbon ultimately sequestered.)

Another response to industry is extension of the date before which construction of the facility must commence. Previously, the construction must have commenced prior to January 1, 2026, but the Act extends that deadline to January 1, 2033.[128]

The Act also significantly reduces threshold sequestration quantities of CO_2 for qualifying facilities.[129] Particularly as to hard-to-abate industries, the IRA reduces the capture quantity requirements for all other industrial facilities to 12,500 metric tons.[130] Additionally, for DAC facilities the threshold is now 1,000 metric tons annually, down from 100,000 metric tons,[131] and specified post-combustion electricity generation plants, the threshold is now 18,750 metric tons annually, down from 500,000 metric tons.[132]

The IRA also resolves another unintended limitation on the prior iteration of 45Q, the inability of tax-exempt entities such as rural cooperatives and municipal utilities that have no federal tax liability to avail themselves of the tax credit. The Act now allows for such entitles to claim direct cash refunds as opposed to tax credits.[133] Even for-profit entities may opt for direct payments under 45Q but only for a five-year period.[134] Finally, further expanding and incentivizing business model flexibility, the Act allows taxpayers to transfer 45Q credits to an unrelated taxpayer beginning January 1, 2023.[135] It is unclear where the "break even" point for financial incentives to at least equal the cost of implementing CCS, critical variables (e.g., the source of the carbon emissions, selection of the capture methodology, location, etc.) being diverse and sometimes proprietary to the operator and source of carbon. But the steady increase of the amounts available under 45Q demonstrate heightened interest by both operators and lawmakers.

State-level incentives, where present, also play an important role in catalyzing the technology and facilities.

> [I]ncentive programs are one of the most important tools the state has in advancing our low carbon future, especially for climate vulnerable communities. The programs ensure clean technology and energy is accessible and are critical to closing opportunity gaps. These programs also leverage private-sector investment, seeking to build

127. *Id.*
128. *Id.*
129. Inflation Reduction Act of 2022 § 13104, 26 U.S.C. 45Q.
130. *Id.*
131. *Id.*
132. *Id.*
133. Inflation Reduction Act of 2022 § 13104, 26 U.S.C. 45Q.
134. *Id.*
135. *Id.*

> sustainable, growing markets for clean and efficient technologies, and they are particularly necessary to support GHG emission reduction strategies for priority sectors, sources, and technologies.[136]

California adopted its own tax credit as part of CARB's LCFS CCS Protocol (Protocol), although no entity has yet sought to demonstrate compliance with the Protocol that would permit access to the credit.[137] Other state incentives previously adopted or under consideration include Kansas (income tax reduction and abatement of property taxes applicable to power plant and sequestration site); New Mexico (advanced energy tax credit for coal facilities that capture and sequester or control CO_2 emission); and Texas (allowing taxpayers to claim a deduction of up to 10% of the amortized cost of equipment used in a clean coal project).[138] The respective role of state incentives and allowance or prohibition of EOR, when paired with 45Q, are worthy of comparison but such analysis is, unfortunately, beyond the scope of this article.

V. REGULATORY REVIEW: NECESSARY BUT A POTENTIALLY FATAL BARRIER ABSENT REFORM

This section addresses the complex, time consuming, and often redundant entitlement and permitting requirements for CDR projects throughout the United States and why they collectively form one of the greatest barriers to deployment of CDR. In addition to federal permitting mandates, each state operates a distinct mosaic of environmental review, land use entitlement, and regulatory permitting mandates at multiple jurisdictional levels. Uncertainties and inconsistencies with untested regulatory regimes, indefinite review times, and litigation exposure challenging approvals inject added risks into CDR project proposals.

A. General Land Use Entitlements

As with most development, construction and operation of a CCS or DAC facility involves disturbance of land and creates environmental impacts.[139] Aside from carbon-removal-specific approvals (e.g., air emissions permits for capture equipment and related energy source), construction and operation of such facilities likely involves general land use entitlements at all jurisdictional levels – federal, state, regional, and local. Such requirements will be specific to the respective site,

136. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 216. "Strategies for Achieving Success: . . . Evaluate and propose, as appropriate, financing mechanisms and incentives to address market barriers for CCS and CDR." *Id.* at 177. For a more comprehensive survey and analysis of various financing options, *see* Edward Hirsch & Thomas Foust, *Policies and Programs Available in the United States in Support of Carbon Capture and Utilization*, 41 ENERGY L. J. 91 (2020).

137. *Carbon Capture and Sequestration Protocol Under the Low Carbon Fuel Standard*, CAL. AIR RESOURCES BD. (Aug. 13, 2018), https://ww2.arb.ca.gov/resources/documents/carbon-capture-and-sequestration-protocol-under-low-carbon-fuel-standard.

138. *Pathway 7: Carbon Capture and Negative Emissions – Carbon Capture and Sequestration*, LEGAL PATHWAYS TO DEEP DECARBONIZATION, https://lpdd.org/pathway/tax-incentives-for-ccs/.

139. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 41-55.

the jurisdiction(s) on and in which it lies, the proposed facilities, and whether it is on public or private land.[140]

All CDR projects will be subject to environmental review and impact analysis that will vary according to federal and state rules.[141] The environmental analysis required for the project will be relative to whatever local permitting or other approvals are required for the CCS or DAR project.[142] These may include a use permit for the land, air permits for the equipment operations, species or aquatic resource permits for land disturbance of protected habitats for the facilities themselves or conveyance pipelines, and other applicable public agency authorities that apply in the respective jurisdictions.[143]

On the federal level, the proposed project will have to comply with the National Environmental Policy Act (NEPA) if the project traverses federal lands or will utilize federal funding for construction or operations.[144] For example, a developer or operator availing themselves of federal tax credits such as section 45Q does not itself implicate NEPA review, but a major grant from DOE for construction of a CDR project, absent a statutory exemption, would. Additionally, most states have their own environmental review regime. In California, for example, proposed projects must comply with the California Environmental Quality Act (CEQA).[145] To comply with CEQA, the project must either be found to be "exempt," or else all potentially significant impacts on the environment must be identified, quantified, and mitigated to the maximum extent feasible.[146] The CEQA analysis in the form of a "negative declaration," "mitigated negative declaration," or "environmental impact report" (EIR) must be processed and certified by the "lead agency," the entity with most authority over the project, usually the local city or county in which the project is sited.[147] Even if significant environmental impacts persist after imposition of all feasible mitigation, the lead agency may still approve the project and certify the EIR via adoption of findings of countervailing public benefits in a "statement of overriding considerations."[148]

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140. DRAFT 2022 SCOPING PLAN, *supra* note 57.

141. CAL. AIR RESOURCES BD., FINAL ENVIRONMENTAL ANALYSIS FOR THE 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY 8 (2022), https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp-appendix-b-final-environmental-analysis.pdf.

142. *Id.* at 32.

143. *Id.* at 50.

144. Final Rulemaking, *Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO2) Geologic Sequestretion Wells*, 75 Fed. Reg. 77,229 (2010) (to be codified at pts. 124, 144-45). However, the processing and issuance of a Class VI injection well, discussed below, is exempt from NEPA review. *Id.* "The SDWA UIC program is exempt from performing an Environmental Impact Statement (EIS) under section 101(2)(C) and an alternatives analysis under section 101(2)(E) of NEPA under a functional equivalence analysis." W. Neb. Res.Council v. EPA, 943 F.2d 867, 871-72 (8th Cir. 1991).

145. *See generally CEQA: The California Environmental Quality Act*, CAL. GOVERNOR'S OFF. OF PLANNING AND RSCH., https://opr.ca.gov/ceqa/; CAL. PUB. RES. CODE §§ 21000 - 21189.3 (West 2023).

146. CAL. PUB. RES. CODE §§ 21000 - 21189.3.

147. *Id.*

148. *Id.*

Environmental review regimes such as NEPA and CEQA are frequently exploited by project opponents such as business competitors, organized labor, or nearby residents for non-environmental purposes.[149] Attorneys' fees recovery provisions further incent such exploitation and add to the cost and processing time for projects.[150]

B. EPA Class VI Underground Injection Control Permit for Sequestration

Both CCS and DAC projects require permits to inject carbon into underground reservoirs, and CCS projects may require extensive pipeline infrastructure to transport carbon from its source to the sequestration site, necessitating regulatory review and permitting for such infrastructure.[151] The primary authorization required for a domestic CCS or DAC project is a Class VI permit from the United States Environmental Protection Agency (EPA) under its underground injection control (UIC) authority under the Federal Safe Drinking Water Act.[152] The timeframe for EPA to process Class VI applications remains one of the greatest unidentified variables in the regulatory process, and the regulated community reportedly is concerned that the lack of experience processing Class VI applications will lead to greater delay and uncertainty.

Although EPA has initial authority over all UIC wells, states and tribes may apply for "primacy" over permitting authorization and enforcement.[153] Under delegated primacy, the subject state or tribe operates in EPA's stead as a project's permitting and enforcement authority to ensure the safe establishment and operation of the well.[154] To date, this delegation function as to Class VI wells has been granted to North Dakota and Wyoming, with Louisiana and, most recently, Texas having applications pending with EPA.[155] The Infrastructure and Investment and

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149. Alastair Bland, *Weakling or Bully? The Battle Over CEQA, the State's Iconic Environmental Law*, CALMATTERS (June 23, 2020), https://calmatters.org/economy/2019/05/weakling-or-bully-ceqa-environmental-law-california-development-battles/.

150. *See* CAL. CIV. PROC. CODE § 1021.5 (West 2023).

151. *See generally Protecting Underground Sources of Water from Underground Injection (UIC)*, ENVT' PROTECTION AGENCY, https://www.epa.gov/uic.

152. *See generally Class VI – Wells used for Geologic Sequestration of Carbon Dioxide*, ENV'T PROTECTION AGENCY, https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-carbon-dioxide; ENV'T PROTECTION AGENCY, UNDERSTANDING THE SAFE DRINKING WATER ACT 3 (2004) https://www.epa.gov/sites/default/files/2015-04/documents/epa816f04030.pdf.

153. *Primary Enforcement Authority for the Underground Injection Control Program*, ENV'T PROTECTION AGENCY, https://www.epa.gov/uic/primary-enforcement-authority-underground-injection-control-program-0.

154. *Id.* ("Primary enforcement authority, often called primacy, refers to state, territory, or tribal responsibilities associated with implementing EPA approved UIC programs. A state, territory, or tribe with UIC primacy, or primary enforcement authority oversees the UIC program in that state, territory, or tribe. . . . States seeking UIC program primacy must demonstrate to EPA that the state has: jurisdiction over underground injection; regulations that meet the federal requirements . . . and the necessary administrative, civil and criminal enforcement penalty remedies.").

155. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 29; *Primary Enforcement Authority for the Underground Injection Control Program*, *supra* note 155; Keith Goldberg, *Texas Aims to Take Charge of Carbon Capture Projects*, LAW360 (Sept. 14, 2022, 9:44 PM), https://www.law360.com/articles/1526346/texas-aims-to-take-charge-of-carbon-capture-projects.

Jobs Act provides funding to EPA that may enable staff capacity and training for CDR including potentially providing grants to state with primacy.[156]

EPA maintains a listing of all active, pending, and withdrawn Class VI permit applications on its website.[157] As of June 2022, EPA had issued six Class VI permits, all in Illinois, only two of which were then active, and EPA was reviewing an additional nine applications.[158] In April 2022, there are 71 permit applications or issuances active with EPA.[159] EPA resources also include guidance documents[160] and an extensive outline intended to help with the very elaborate Class VI application documentation and process.[161]

C. Infrastructure Requirements for CCS

Locations of carbon capture facilities – especially for hard-to-abate industries – may be far away from sequestration reservoirs, necessitating extensive pipelines for transport of the concentrated carbon. Those pipeline networks must also undergo regulatory approval.[162] Calls for national, regionally significant pipeline infrastructure implicate both federal and multi-jurisdictional review and approval mandates. "Driving infrastructure development to support a net zero economy should be a priority of governments everywhere."[163] Analogizing to the need for government subsidy of or incentives for development of major infrastructure such as "road, rail, telecommunications, electricity generation and distribution, space exploration and more recently, renewable energy," experts call for similar support for and investment in CCS and DAC infrastructure nationwide.[164] "[T]heir support or direct investment was required to de-risk and initiate industries. . . . As these industries matured and became commercial, government intervention was replaced by increased private sector investment."[165]

Combining the recent broad recognition of the essential role carbon removal will play in accomplishing global climate goals with the significant approval and construction time required to establish such projects, advocates are sounding the

156. Request for Comments, *Carbon Capture, Utilization and Sequestration Guidance*, 87 Fed. Reg. 8,808, 8,810 (2022).

157. *Class VI Wells Permitted by EPA*, ENV'T PROTECTION AGENCY, https://www.epa.gov/uic/class-vi-wells-permitted-epa.

158. EPA, EPA REPORT TO CONGRESS: CLASS VI PERMITTING 15 (2022), https://www.epa.gov/system/files/documents/2022-11/EPA%20Class%20VI%20Permitting%20Report%20to%20Congress.pdf.

159. *Id.*

160. *Class VI Guidance Documents*, ENV'T PROTECTION AGENCY, https://www.epa.gov/uic/class-vi-guidance-documents.

161. ENV'T PROTECTION AGENCY, CLASS VI PERMIT APPLICATION OUTLINE (2022), https://www.epa.gov/system/files/documents/2022-07/class_vi_permit_application_outline.pdf.

162. DEP'T OF ENERGY, SITING AND REGULATING CARBON CAPTURE, UTILIZATION AND STORAGE INFRASTRUCTURE (2017), https://www.energy.gov/fecm/articles/siting-and-regulating-carbon-capture-utilization-and-storage-infrastructure-workshop.

163. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 12.

164. *Id.* A DAC startup CEO likening DAC to eventually serving as "essential infrastructure' such as waste disposal or sewage." Evans, *supra* note 1.

165. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 12.

alarm: "There is no time to waste."[166] In 2020, a Stanford University report identified more than 70 facilities in California that could benefit from CCS, most of which were located either in the San Francisco Bay region or Los Angeles.[167] But the greatest and safest potential sequestration facilities in California are in its Central Valley region, more than 100 miles from the facilities identified in the report.[168] Individual projects would be unlikely to undertake a CCS program to scrub industrial emissions if the issue of transporting the concentrated carbon stream over 100 miles to a sequestration facility remained unresolved. Those 100 miles would traverse multiple property ownerships, governmental jurisdictions, and geologic impediments. Obtaining the concession of each landowner to impact/traverse their land and all land use approvals from each impacted state and local jurisdiction would make up-front investment in the essential infrastructure project highly uncertain as to approval, timeline, and susceptibility to multiple independent litigation challenges. One extreme option to eliminate or at least streamline this process is taking the land via eminent domain by the state or federal government, but such a political process is highly contentious and there is no evidence of political will for such extraordinary measures at this point.

However, there is a recent trend of "CCS networks" "sharing CO_2 transport and storage infrastructure, pipelines, shipping, port facilities, and storage wells."[169] These economies of scale for CCS infrastructure allow smaller projects to participate and benefit.[170] Also, given that heavy industries tend to congregate and be concentrated in close proximity due to land use regulation, CCS networks can facilitate broader CCS implementation.[171] Finally, the lowering of the qualifying threshold for the 45Q tax credit is designed to make CCS more attractive to smaller industrial with newly established access to 45Q.

166. *Id.* ("Large infrastructure projects like CCS facilities or pipeline networks usually take seven to 10 years from concept study through feasibility to design, construction then operation. There is no time to waste. Creating an enabling environment for investment in CCS facilities and other net zero aligned assets – particularly in supporting infrastructure – through both policy and funding, should be a high priority for governments between now and 2030.").

167. ENERGY FUTURES INITIATIVE & STANFORD UNIVERSITY, AN ACTION PLAN FOR CARBON CAPTURE AND STORAGE IN CALIFORNIA: OPPORTUNITIES, CHALLENGES, AND SOLUTIONS – SUMMARY FOR POLICYMAKERS S-7 (October 2020), https://sccs.stanford.edu/sites/g/files/sbiybj17761/files/media/file/EFI-Stanford-CA-CCS-SFPM-rev2-12.11.20.pdf; Briscoe, *supra* note 10.

168. Briscoe, *supra* note 10. "The state climate plan also calls for this technology to be installed on a majority of the state oil refineries by 2030, in an effort to curb emissions while still meeting local demand for gasoline and diesel. But this would probably require billions of dollars in investments to install equipment that would siphon carbon emission from smokestacks and build a network of pipelines from Los Angeles and Bay Area refining hubs to the Central Valley." *Id.*

169. GLOBAL STATUS OF CCS 2021 – CCS ACCELERATING TO NET ZERO, *supra* note 2, at 18.

170. *Id.*

171. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 174-75.

D. Regulatory Streamlining Efforts

1. State Streamlining Efforts

States know how to streamline and insulate must-have projects from standard regulatory exposure and litigation risk. From fast-tracking a new National Football League stadium or expansion of critical infrastructure, streamlining provisions may include abridged or elimination of environmental review, curtailment of grounds for litigation challenges to approvals, expedited permitting review and processing, and dedicated and consolidated authorities to oversee project approval on specified terms and timeframes. California is no exception, and varying degrees of legislative streamlining illustrate the perceived "urgency" of disparate climate strategies.

There are multiple levels of agency review of CDR projects beyond the EPA Class VI review at both the federal and state levels, and there have been multiple calls in California for coordination and streamlining of entitlement efforts with only limited success.[172] Governor Newsom's 2022 legislative proposal called on lawmakers to adopt five specific climate-related measures, one of which contained a model "unified permit application" for CCS and DAC projects to be administered by a state agency and into which all local agencies would be required to fold their local approvals and jurisdictional authorities.[173] It appeared to be an effort to direct all CCS and DAC applications to a single, centralized, state-level agency with comprehensive experience to evaluate and facilitate CDR, on which the state has declared it will increasingly rely to achieve aggressive climate goals. But as the proposed language underwent non-public debate and negotiation (all jurisdictional legislative committees having long since been adjourned for the session), the language of the measure became increasingly watered down. As shown below, the measure ultimately became voluntary at the discretion of the applicant and specifically stated that any newly established permitting process will not abridge or curtail the independent and segregated authority of agencies to exercise their full review of any proposed CCS project, including full CEQA review and potential litigation exposure.[174]

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172. *Id.* at 146 ("Recent legislation, such as SB 350 (De Leon and Leno, Chapter 457, Statutes of 2015), has recognized the need for CARB, the California Energy Commission (CEC), and the California Public Utilities Commission (CPUC) to work together to ensure the state's energy and climate goals were integrated in procurement decisions by load serving entities as part of the Integrated Resource Plan. Moving forward, it is especially critical that similar approaches are adopted to break down silos across state agencies to ensure policies and program s are aligned with multiple state priorities outlined in this plan. Finally, supportive legislative direction may also benefit emerging areas of policy, such as CO2 removal, to provide agency authority and roles for these nascent efforts, including streamlining of permitting, while ensuring that protections for communities are in place.").

173. Barry, *supra* note 43, at 2.

174. CAL. HEALTH AND SAFETY CODE § 39741; CAL. PUB. RES. CODE §§ 2213, 3132.

The Governor's initial CCS/CCUS legislative proposal was dated August 9, 2022.[175] The draft language included the addition of a new section 39741.2 to the California Health and Safety Code and provided, in relevant part:

> [O]n or before January 1, 2025, the state board shall, in consultation with relevant state and local agencies, adopt regulations for a ***model unified permit program*** for the construction and operation of carbon dioxide capture and sequestration projects ***to streamline the issuance of permits or other authorizations*** for the construction and operation of those projects. The permit program ***shall establish an application*** that ***requires the submission of all information required by permits and other authorizations from relevant state and local agencies*** necessary for the construction and operation of a carbon dioxide capture and sequestration project.
> . . .
> The model unified permit program ***shall be used*** by relevant state and local agencies when issuing a permit or other authorization for the construction and operation of a carbon dioxide capture and sequestration project. [***Emphasis*** added.][176]

Pursuant to the draft language, the "model unified permit program" was just one component of a broader "Carbon Capture, Utilization, and Storage Program" to be established by CARB in accord with specified requirements.[177] According to the draft legislation, the purpose of the program was to "(1) Facilitate the development, deployment, and commercialization of CCUS technologies," and "(2) Advance the deployment of carbon dioxide and sequestration projects."[178] And in carrying out the program, CARB was to prioritize, among other things, "[r]educing the emissions of greenhouse gases" and "[r]educing fossil fuel production in the state."[179]

But what the legislature adopted and the governor signed was quite different. In the waning hours of the 2022 legislative session in a maneuver known as "gut-and-amend," the final negotiated language was inserted into an existing legislative proposal, SB 905 (Skinner), that was previously focused on pilot projects for utilization of CCS specifically in the cement industry.[180] The ultimately adopted SB 905[181] includes the "unified" permitting regime, but with significant qualifiers that arguably eliminate any notion of consolidated or streamlined review by making

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175. Rachel Becker & Julie Cart, *Newsom to Legislature: Act fast to enact new climate change targets*, CALMATTERS (Aug. 9, 2022), https://calmatters.org/environment/2022/08/climate-change-newsom-legislature/.

176. Proposed language, S.B. 438, 2023-2024 Reg. Sess. (Cal. 2023).

177. Barry, *supra* note 43 ("CARB would also be required under the proposal to 'develop a model unified permitting program for geologic carbon sequestration projects to be used by state and local agencies with applicable permitting authority and would create a tracking system for all CCUS technologies and geologic carbon sequestration projects deployed throughout the state.'").

178. Proposed language, S.B. 438, 2023-2024 Reg. Sess.

179. CAL. HEALTH AND SAFETY CODE § 39741; CAL. PUB. RES. CODE §§ 2213, 3132. "'This proposal would establish a program at [CARB] focused on the dual objectives of advancing [CCUS] technologies and deploying geologic carbon sequestration projects,' the governor's memo says. 'In carrying out these objectives, the State Board would be required to prioritize greenhouse gas emission reductions, minimizing impacts to communities where these technologies and projects are developed, maximizing workforce development and employment in these communities, leveraging various funding sources, and reducing fossil fuel production in the state'". Barry, *supra* note 43.

180. CAL. HEALTH AND SAFETY CODE § 39741; CAL. PUB. RES. CODE §§ 2213, 3132

181. *Id.*

reliance on the program optional to the applicant and perpetuating all existing review processes, however inefficient or redundant:

> [O]n or before January 1, 2025, the state board shall, in consultation with relevant state and local agencies, adopt regulations for a unified permit application for the construction and operation of carbon dioxide capture, removal, or sequestration projects to expedite the issuance of permits or other authorizations for the construction and operation of those projects. The unified permit application ***shall solicit from applicants***, and direct to all relevant state agencies, all information needed to obtain permits and other authorizations from relevant state and local agencies necessary for the construction and operation of a carbon dioxide capture, removal, or sequestration project. ***An applicant's use of the unified permit application shall be optional.*** [***Emphasis*** added.][182]

Additionally, the uniform permit program was expressly prohibited from curtailing or otherwise abridging environmental review of any aspect of the project under CEQA,[183] and stated that although the intent of the program was "for the purpose of efficiency," it nonetheless "shall not displace the role of individual permitting agencies and shall not eliminate, abridge, or reduce the review or issuance of the individual permits covered by the application by the respective agencies."[184]

Thus, what was intended to facilitate integration, streamlining, and expedited review of CCS and CCUS at the state level by an experienced and empowered single expert agency became so watered down that it pays only lip-service to "efficiency" and efforts to "streamline duplicative administrative requirements or permit application questions."[185] Instead, it expressly codified that no permit process by any discrete permitting agency shall be abridged or reduced and in no instance shall CEQA review be at all curtailed.[186] In other words, it enshrined the status quo. Evolution of the bill was not so much a repudiation of the intended streamlining and efficiency, *per se*. Rather, interests vested in and empowered by discrete components of the overall review process appear not to have been willing to sacrifice their respective review or approval authority in the interest of that overall expediency.

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182. *Id.*

183. CAL. HEALTH AND SAFETY CODE § 39741; CAL. PUB. RES. CODE §§ 2213, 3132. "The unified permit application developed by the state board pursuant to subdivision (a) shall not impair, abridge, or alter any rights or obligations under the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code), or its implementing regulations, with respect to the review or approval of a carbon dioxide capture, removal, or sequestration project." *Id.*

184. *Id.* "The unified permit application developed by the state board pursuant to subdivision (a) is for the purpose of efficiency but shall not displace the role of individual permitting agencies and shall not eliminate, abridge, or reduce the review or issuance of the individual permits covered by the application by the respective agencies. As part of the unified permit application, the state board shall, where possible, streamline duplicative administrative requirements or permit application questions." *Id.*

185. *Id.*

186. CAL. HEALTH AND SAFETY CODE §§ 39741, 39741.2.

Also worthy of note is that from the earliest version of Governor Newsom's proposed legislative package, it statutorily banned the use of CCS for EOR in California.[187] This was apparently in response to political pressure for environmental advocates' strong opposition to any perpetuation of fossil fuel production attributable to CCS. The EOR prohibition language bounced from various vehicles during negotiations but was ultimately codified in SB 1314 (Limon).[188]

Strikingly in political contrast, just two months before in June, Governor Newsom used a much more clandestine legislative tactic – burying broad reform provisions in a must-pass budget bill -- to push through extraordinary regulatory streamlining for a very narrow, select category of renewable generation projects.[189] The "back room" select negotiations infuriated excluded environmentalists and local government interest, among others.[190] AB 205,[191] the must-pass budget bill, gives developers the ability to "opt-in" for a streamlined environmental review and approval process for solar, wind, and other select specified clean energy generation projects under newly defined exclusive state jurisdiction that, among other things, usurps local land use authority from cities and counties, eliminates CEQA review, and even overrides the California Coastal Act in specified instances.[192] The takeaway appears to be that the imperative of streamlining for actual renewable generation projects warranted extraordinary abridgement of legislative procedure and public transparency to ensure adoption, whereas streamlining for CDR, or at least the politics thereof, was less essential or worthy of the expenditure of political capital. In any event, the extra-legislative measures employed by California's Governor and legislative leadership to accomplish passage of each measure attest to the political volatility and difficulty of accomplishing meaningful consolidation and streamlining, even in a jurisdiction where sympathetic political interests hold the governorship and super majorities in each legislative chamber.

187. *Governor Newsom Signs Sweeping Climate Measures*, *Ushering in New Era of World Leading Climate Action*, OFF. OF GAVIN NEWSOM (Sept. 16, 2022), https://www.gov.ca.gov/2022/09/16/governor-newsom-signs-sweeping-climate-measures-ushering-in-new-era-of-world-leading-climate-action/.

188. CAL. PUB. RES. CODE § 3132. "An operator shall not inject a concentrated carbon dioxide fluid produced by a carbon dioxide capture project or carbon dioxide capture and sequestration project into a Class II well for purposes of enhanced oil recovery, including the facilitation of enhanced oil recovery from another well." *Id.* "Newsom officials are acknowledging concerns among some Democratic lawmakers, environmentalists and equity groups about CCUS by adding that 'the state must avoid projects that worsen climate change. Specifically, this proposal would prohibit an operator from using concentrated carbon fluids for purposes of enhanced oil recovery.'" Barry, *supra* note 43.

189. Julie Cart, *Legislators, Newsom Negotiating Behind Closed Doors Over Energy Deal*, CALMATTERS (June 23, 2022) https://calmatters.org/environment/2022/06/energy-deal-budget-talks/.

190. *Id.*; Julie Cart, *Wrangling Over Renewables: Counties Push Back on Newsom Administration Usurping Local Control*, CALMATTERS (Aug. 4, 2022) https://calmatters.org/environment/2022/08/renewable-energy-california-counties/.

191. A.B. 205, Gen. Assemb. (Cal. 2022).

192. *Id.*; CAL. PUB. RES. CODE § 25794.1(b) (West 2022).

2. Federal Streamlining Efforts

On the federal agency front, the Council on Environmental Quality (CEQ)[193] proposed in a draft guidance document streamlined though thorough review of CCS projects, particularly as to a national network of pipeline infrastructure for the transport of carbon streams to regional sequestration facilities throughout the country.[194] Potentially crossing multiple states and innumerable local jurisdictions and private property ownerships, the regulatory compliance requirements for such vast infrastructure could be the greatest barrier to timely CDR deployment at the scale required. The proposed guidance builds off a CEQ report to Congress in June 2021.[195] That report affirmed the essential role of CCS, CCUS, and DAC in the United States meeting its targets relative to the Paris Agreement and discussed the need for and strategies to accomplish integrated regulatory review and streamlined processing for an extensive backbone network of CO_2 pipelines for delivery of carbon to regionally significant sequestration hubs, such as those being explored by DOE.[196]

As to that national network of carbon conveyance infrastructure via backbone pipeline networks, CEQ states:

> Carbon dioxide pipelines and permanent sequestration are critical to the future nationwide deployment of CCUS. Extensive analysis identifies the priority pathways and necessary pipeline infrastructure required to achieve CCUS and permanent sequestration at a climate-relevant scale across all industries, but significant investments, planning, and community engagement and analysis are required. An expanded carbon dioxide pipeline and sequestration network in the United States should be accompanied by close monitoring and enforcement of existing regulations and development of new tools to monitor and improve safety while also reducing the number of incidents that result in leakage of carbon dioxide.[197]

The CEQ report to Congress states that an existing 5,200 miles of dedicated CO_2 pipelines exist in the United States and that 52 million tons of CO_2 were supplied for EOR in 2019.[198] However, "[a]ccording to the Intergovernmental Panel on Climate Change, the scale of CDR required to stabilize global temperatures is on the order of 100-1,000 gigatons (Gt) of CO2 over the 21st century."[199]

The new proposed CEQ guidance "includes recommendations for federal agencies that would support the efficient, orderly, and responsible development

193. CEQ is a direct affiliate of the White House advising federal agencies on implementation of NEPA and other environmental matters. *Council on Environmental Quality,* THE WHITE HOUSE, https://www.whitehouse.gov/ceq/.

194. 87 Fed. Reg. 8,808.

195. COUNCIL ON ENV'T QUALITY, COUNCIL ON ENVIRONMENTAL QUALITY REPORT TO CONGRESS ON CARBON CAPTURE, UTILIZATION, AND SEQUESTRATION (2021) https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf.

196. *Id.* at 6-8.

197. *See* 87 Fed. Reg. 8,808, at 8,810.

198. COUNCIL ON ENVIRONMENTAL QUALITY REPORT TO CONGRESS ON CARBON CAPTURE, UTILIZATION, AND SEQUESTRATION, *supra* note 195, at 6.

199. *Id.*

and permitting of CCUS projects at an increased scale in line with the Administration's climate, economic, and public health goals.'[fn] In the document, CEQ provides guidance to federal agencies on the processes for permitting and review of CCS projects and CO2 pipelines, public engagement, and assessing environmental impacts of CCS projects."[200] Amid concerns raised by environmental justice groups as to CCS/CCUS perpetuating reliance on fossil fuels, CEQ extended the public comment period on the draft rule from March 18, 2022, to April 18, 2022.[201] As of the drafting of this article, the guidance remains pending as "interim," with the public comment period having closed.

E. Environmental Justice

As efforts to combat climate have grown more robust, advocates for environmental justice implications to disadvantage communities have grown increasingly. As to CCS, environmental justice advocates focus primarily on two gating concerns. First, even if CCS successfully removes appreciable quantities of carbon from post-combustion emission streams, they contend those operations have additional criteria or hazardous air pollutants that are not removed and their deposition on surrounding communities is thus prolonged than if the fossil operations were more expeditiously phased out.[202] Second, they claim that sequestration is not a proven technology and that CO_2 leaks and potential seismicity triggers threaten surrounding communities.[203]

> Environmentalists long have been skeptical of carbon capture and storage over concerns about its costs and environmental impact. They point to a series of failed and expensive CCS projects as a sign of the risks that could prevent the technology from delivering deep emission reductions. Many would capture carbon dioxide from power plants and pump it into aging oil fields to stimulate more crude production.[204]

In one of the most coordinated displays of opposition to CCS/CCUS, more than 80 environmental justice groups signed onto a letter urging EPA Region IX Administrator Martha Guzman to deny Class VI injection permitting for any CCUS projects in California's Central Valley.[205] Noting the existing air quality

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200. 87 Fed. Reg. 8,808, at 8,808-11.

201. *Id.* at 8,808.

202. Curt Barry, *Groups Urge EPA to Deny Permit Requests for CCUS in Central California*, INSIDE EPA (June 29, 2022), https://insideepa.com/daily-news/groups-urge-epa-deny-permit-requests-ccus-central-california ("A coalition of more than 80 environmental, equity and public-health groups is urging EPA to deny permit request for carbon capture, use and storage (CCUS) projects in California's Central Valley, charging they will exacerbate fossil fuel pollution and elevating debate over whether the technologies should play a role in achieving the state's climate objectives.").

203. DRAFT 2022 SCOPING PLAN, *supra* note 57, at 69 ("It is important to recognize that the EJ Advisory Committee has raised multiple concerns related to the inclusion of CCS and mechanical CDR in the Draft Scoping Plan. Concerns range from potential negative health and air quality impacts, to safety concerns related to potential leaks, to viability of current technology.").

204. Benjamin Storrow, *Supreme Court Ruling Opens Door to Carbon Capture*, E&E NEWS (July 5, 2022) https://subscriber.politicopro.com/article/eenews/2022/07/05/supreme-court-ruling-opens-door-to-carbon-capture-00043852.

205. Barry, *supra* note 202.

challenges of Central Valley communities, the coalition highlighted their particular vulnerability: "'Frontline communities of color and low-income communities are already overburdened with air pollution, which human-caused climate impacts are only worsening. Instead of perpetuating old, dirty fossil fuel-based infrastructure in environmental justice neighborhoods, we should invest in clean, renewable energy and reliable, equitable storage'. . . ."[206] As noted above, however, advocacy by such groups in the context of Governor Newsom's late-session climate legislative push only advocated for express prohibition in the context of EOR.[207] The tempered position seemed to assert ongoing opposition to any delay of complete phase out of fossil fuels attributable to CDR in any form but recognize the likely necessity for CDR in other challenging industries for which a transition is more elusive.

VI. RECOMMENDATION/CONCLUSION

Notwithstanding the extreme cost and unproven nature of large-scale CDR, environmental justice advocates' decrying of CDR facilitating ongoing criteria pollutant emissions near disadvantaged communities, and concerns over the long-term integrity of sequestration facilities, nearly all authorities are looking to CDR. The fact remains that the world, like California, is not reducing global emissions urgently enough to meet the Paris objectives, and CDR is now considered my many a given.

However, as presented herein, there appears to be no path by which CDR is scaled and deployed in a timely and sufficient degree to secure milestones identified in Paris. Nonetheless, the world cannot wait to discover whether CDR can be scaled and deployed at the magnitudes projected to be required while these policy conflicts are debated in Congress, parliaments, and the United Nations, among others. Reliance is being committed in national and international policy enactments; reliability must quickly be proven (or disproven). Accordingly, this article offers the following recommendations of incentives and regulations, carrots and sticks, notwithstanding missing Paris objectives:[208]

- ***Federal Funding:*** The IRA and Infrastructure Investment and Jobs Act provided meaningful and much needed financial resources and incentives for CDR. According to authorities, more will be required.[209] But it will take ambitious project proposals and aggressive approval efforts to deploy all of the funds currently appropriated. Those funds should be put to work as soon as reasonably possible with more appropriations made as soon as is necessary to

206. *Id.*

207. *Id.*

208. The author recognizes that each of these proposed incentives and streamlining measures comes at the expense of some countervailing public policy priority, and he is not asserting that such counter arguments are without merit. Rather, given that emission reductions are proving deficient and that critical policy makers are ascribing substantial future reliance to DAC, the author asserts it is vital to determine urgently whether such future reliance has a legitimate basis in fact.

209. *See supra* note 25.

continue advancement of the respective technologies. The impact of the IRA should be monitored and adjustments and additions made to ensure the technology availability and deployment match need and sufficient resources are appropriated to ensure economic viability.

- ***State Primacy of Class VI Authority:*** The EPA should encourage and facilitate primacy delegation of the Class VI UIC well permitting, implementation, and enforcement authority to states, not unlike the National Pollutant Discharge Elimination System[210] program under the Clean Water Act, the implementation and enforcement of which the vast majority of states have assumed from EPA.[211] Respective states may then integrate federal review mandates with state and local procedures into a consolidated review regime, eliminating duplication and regulatory redundancies. EPA has made financial resources available to states carrying out these functions. And this should be especially true for infrastructure and sequestration facilities that benefit multiple states and regions.[212] The job creation and economic development potential of major infrastructure investment should also be a material incentive for states to undertake these programs.
- ***Integrated Federal and State Environmental Review:*** Even absent state primacy delegation, federal and state environmental review regimes under NEPA and corresponding state regimes for all aspects of capture, transport, and injection facilities should be consolidated and integrated into a single, if joint, public process and review with a finite timeframe for completion and elimination or substantial limitation of attorneys' fees recovery provisions.[213] CEQ previously published guidance on integrating NEPA and state-level environmental review.[214] But even in such a context, review must remain comprehensive and robust or it will be subject to judicial invalidation. The objective is to make the process predictable and finite, not toothless.

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210. *National Pollutant Discharge Elimination System*, ENV'T PROTECTION AGENCY https://www.epa.gov/npdes.

211. *Id.*

212. At the state level, it is common for jurisdictions to require project applicants to reimburse the jurisdiction for staff time and any specialty consultants to process the application. This is less common at the federal level. Federal agencies should be more open to recouping costs from project applicants, while maintaining objective control of the process, so as to ensure adequate resources for processing and public involvement.

213. 87 Fed. Reg. 8,808, at 8809 ("To facilitate the deployment of CCUS in the United States, in line with the Administration's climate and economic goals, agencies should consider developing programmatic environmental reviews, such as tiered documents or programmatic environmental impact statements (PEISs) under NEPA, or programmatic biological opinions under the ESA, where such analyses can facilitate more efficient and effective environmental reviews of multiple projects while maintaining strong community engagement.").

214. NAT'L ENV'T POLICY ACT, NEPA CEQA HANDBOOK, https://ceq.doe.gov/publications/NEPA-CEQA_Handbook.html.

- ***National Backbone Pipeline Infrastructure:*** As for a national, interstate pipeline network to transport consolidated carbon streams to regional sequestration facilities, federal eminent domain authorization should be established and a "general permit" regime should be adopted similar to the Nationwide Permit regime under the Army Corps of Engineers and EPA for the Clean Water Act Section 404 permitting program.[215] Such permitting regimes establish criteria and compliance mandates in advance and irrespective of any given project and individual projects opt-in by demonstrating compliance or consistency with the established criteria with minimum bureaucracy and individual project application and review processes.[216]
- ***Consolidated Federal Agency Permitting Review:*** To the degree Class VI permitting remains with EPA as opposed to primacy delegation to a state, all additional agency review of a sequestration facility for which a Class VI permit is sought should be integrated with the already extensive Class VI permit application and review process. This includes additional federal agency review and consolidated resolution of issues such as "permanence," future monitoring and financial assurances, long-term responsibility for facilities, application of NEPA, and consolidated review related to imperiled species and aquatic resources under a "general permit" or similarly streamlined and integrated regime.
- ***Consolidated State and Local Agency Review:*** Similarly, state agency review of environmental impacts, local land use permitting, and equipment permitting should be consolidated and integrated under the auspices of a single, specialized agency.[217] California's Governor Newsom accomplished this as to new selected renewable generation project via clandestine legislative maneuvering but was unable or unwilling to do the same for CDR, at least for now.[218]
- ***Finite Timeframes for All Stakeholders, Regulators and Applicants:*** An indefinite permitting review horizon and the risk of litigation time and expense can sideline potential investors and financing resources for CDR projects. Given the recognized essential role of CDR and urgency to prove its economic viability and scalability, all permitting and review processes at all jurisdictional levels should have reasonable but definite and finite timeframes for completion. This will include express and finite timeframes with which developers and operators would also have to adhere as well as concurrent, adequate, and proscribed review and comment periods for

215. *2021 Nationwide Permit Information*, U.S. ARMY CORPS OF ENG'RS, https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Nationwide-Permits/.

216. *Id.*

217. That Governor Newsom felt empowered and without option but to adopt his most stringent streamlining and integration for the most select and desired renewable projects in a wholly non-public and clandestine budget process bears witness both to the political difficulty but also sense of urgency and essential nature of such measures.

218. *See supra*, Sections V.A, B.

environmental justice and Native American tribal land consultations.

CONTROL, FAULT, AND KNOCK-FOR-KNOCK: A GUIDE TO SELECTING INDEMNITIES IN ENERGY CONSTRUCTION AND SERVICES AGREEMENTS

S. Scott Gaille[*]
Tanner Harris[**]

Synopsis: Selecting an indemnity in construction and services agreements continues to present challenges for both energy project owners and their contractors. Legacy classification of indemnity clauses into categories such as "broad form," "intermediate form," and "limited form" no longer serves a useful purpose as many anti-indemnity statutes prohibit broad form and intermediate form indemnities. We propose a new framework for selecting energy construction and services indemnities that is based primarily on the degree of control exerted over the project site. A "control-based indemnity," which places the burden of proof on the contractor to demonstrate that the owner did not cause the loss, should be used when the contractor controls the worksite. A "fault-based indemnity," which places the burden of proof on the owner to demonstrate that the contractor caused the loss, should be used when the contractor does not control the work site. A "knock-for-knock indemnity," which makes each of the contracting parties responsible for their own losses regardless of the cause, should be used when there are many contractors conducting operations at a single worksite, where determination of responsibility for a loss can be difficult and expensive. By analyzing the relative level of control exercised over the worksite by the contractor, parties can select indemnities that more suitably allocate risk. This framework also generally reflects the indemnity usage our law firm has recently observed while negotiating energy construction and services agreements, including those for pipeline, solar, wind, LNG, carbon capture, refinery, nuclear, and other facilities.[1]

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1. While we discuss and apply this indemnity framework in the context of energy construction and services agreements, these principles may find useful application in other industries and circumstances which are outside the scope of this article.

I. INTRODUCTION

Indemnities are hard. Even in the cerebral halls of The University of Chicago Law School, the very mention of the word "indemnity" causes students' eyes to glaze over. The words in an indemnity clause may be written in English, but they are loaded with hidden meanings and implications. One student struggling to understand an indemnity clause described it as a "house of mirrors." On top of the contractual language, practitioners must contend with varying statutory regimes, which potentially reduce enforceability of indemnities.[2]

Energy project owners and their contractors use indemnity clauses to modify the fault-based liability regime that would otherwise control under applicable law. Owners and contractors should be able to reduce moral hazard—which arises when one party's incentive to take precautions is diminished due to another person bearing the consequences of a loss[3]—by placing liability for certain risks in the hands of the party best able to avoid that risk.[4] When an owner shifts more risk to a contractor than would otherwise exist under applicable law,[5] the parties should expect a corresponding increase in the price for the contractor's work. Owners are therefore incentivized to select an indemnity regime that maximizes the gains achieved through elimination of moral hazard while minimizing the costs arising from excessive allocation of risk to the contractor.[6] If a contractor is well-positioned to prevent a loss from occurring, the price for it bearing such a risk should be less than if the contractor is asked to bear losses that it cannot prevent.

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2. While this article peripherally discusses issues that arise from the interaction of contractual indemnity language with applicable law, the interaction between indemnity language and local law is not its focus. Each practitioner must take care to ensure that indemnity language is consistent with applicable law.

3. David Rowell & Luke B. Connelly, *A History of the Term "Moral Hazard"*, 79 J. OF RISK AND INS. 1051 (2012). The term "moral hazard" originated in insurance literature and has been adopted by economists to generally describe loss-increasing behavior that arises under insurance or in other contexts where Party A bears the costs of Party B's actions, and Party B therefore lacks adequate incentive to minimize losses. *Id.* at 1051.

4. Evra Corp. v. Swiss Bank Corp., 673 F.2d 951, 957 (7th Cir. 1982) ("[T]he costs of the untoward consequences of a course of dealings should be borne by that party who was able to avert the consequence at least cost and failed to do so.") (describing the animating principle of Hadley v. Baxendale [1854] 156 Eng. Rep. 145). Placing the costs of negative consequences in the hands of the party best able to avoid those negative consequences is a concept arising in tort law. *Id.*

5. S. Scott Gaille, *Reducing Conflict and Risk: Why Parties Benefit from Using Enumerated Adjustment Clauses in Energy Construction and Services Agreements*, 42 ENERGY L. J., 123 (2021). There are situations where a project owner is better served by accepting additional risk rather than shifting risk to the contractor. *Id*. at 138-39 ("By bearing the risk for differing site conditions, owners receive bids closer to the true cost of work. Owners can then engage the most efficient contractor rather than the contractor who may have been a poor estimator of the risk of encountering differing site conditions and thus submitted the lowest bid.").

6. Penny L. Parker & John Slavich, *Contractual Efforts to Allocate the Risk of Environmental Liability: Is There a Way to Make Indemnities Worth More Than the Paper They Are Written On?*, 44 SMU L. REV. 1349 (1991). A contractual indemnity may also operate to *limit* the indemnitor's liability to the indemnitee such that the indemnitor's liability is less than its liability would otherwise be under the fault-based liability regime that would otherwise apply. *Id.* at 1351-52 ("Under certain circumstances, an indemnity may actually serve to limit, not extend, the indemnitor's liability to the indemnitee. For example, an indemnity drafted as the exclusive

Practitioners have traditionally placed indemnity provisions into three categories:[7] (1) "broad form" (also called "sole negligence"); (2) "intermediate form" (also called "contributory fault"); and (3) "limited form" (also called "comparative fault").

- *Broad Form.* A broad-form indemnity requires the contractor to indemnify the owner against all losses which occur in connection with the contractor's work, even losses caused by the owner's sole negligence. This type of indemnity uses language that requires the contractor to indemnify the owner "regardless of the fault" of the owner.
- *Intermediate Form.* An intermediate-form indemnity requires the contractor to indemnify the owner against all losses which occur in connection with the contractor's work, except in cases of the owner's sole negligence. This means that if the contractor is found to be even 1% responsible for a loss, it becomes obligated to indemnify the owner for the entire loss.
- *Limited Form.* A limited-form indemnity is usually based on comparative fault,[8] which requires the contractor to indemnify the owner for losses only to the extent that the owner can demonstrate the contractor's responsibility for the loss. This means that if the contractor is found 1% responsible for a loss, it is only required to

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remedy between the parties may be limited contractually to a 'survival' period that is shorter than the statute of limitations for actions that could otherwise be brought under applicable tort and contract theories.").

7. Edward Arnold et al., *What Does the Indemnity Clause Cover and When Does the Claim Accrue,* SEYFARTH (Jan. 2, 2019), https://www.constructionseyt.com/2019/01/indemnity-clause-cover-claim-accrue/. Indemnification generally includes the duty to defend, and contractual obligations in the energy industry are no different. Scott Gaille, *3 Types of Indemnities (Energy Construction),* GAILLE PLLC (July 10, 2019), https://gaillelaw.com/2019/07/10/3-types-of-indemnity-energy-construction-gaille-energy-blog-issue-79. While the duty to indemnify is "a duty to make good any loss, damage, or liability incurred by another," this duty generally arises at the end of a lengthy fact-finding (and potentially litigious) process that may take months or years to resolve. *Indemnity*, Black's Law Dictionary (10th Ed. 2014); Christopher R. Mosley et al., *Litigating the Duty to Indemnify*, SHERMANHOWARD (Mar. 9, 2022), http://shermanhoward.com/wp-content/uploads/2022/04/Litigating-the-Duty-to-Indemnify.pdf. By contrast, the duty to defend includes active defense or funding of the defense while the fact-finding process is ongoing and pending resolution. For further discussion, *see* Sean McChristian, *Indemnity vs. Duty to Defend: Know the Differences and Potential Critical Variations in State Law*, UNDER CONSTR.: A.B.A. F. ON CONSTR. L. (Aug. 16, 2019), https://www.americanbar.org/groups/construction_industry/publications/under_construction/2019/summer/indemnity-vs-duty/.

8. Arnold et al., *supra* note 7. A limited-form indemnity also can be further limited based on contributory fault. Tom Stilwell & Sameer Mohan, *Deconstructing Anti-Indemnity in Texas, Louisiana, California and New York*, BAKERHOSTETLER (May 14, 2015), https://www.bakerlaw.com/files/uploads/News/Linked%20documents/ConstructioAnti-IndemnityPresentation.pptx. A contributory fault approach requires the contractor to indemnify the owner for losses which occur in connection with the contractor's work, to the extent that the owner can demonstrate that the owner was not contributorily at fault for the loss. This form of indemnity is the conceptual opposite of the intermediate form, because if the owner cannot prove that the contractor was 100% at fault for the loss, it cannot obtain the indemnity. *Understanding Indemnification Clauses*, MAYNARDNEXSEN (Dec. 6, 2021), https://www.maynardnexsen.com/publication-understanding-indemnification-clauses. This type of indemnity uses language that requires the contractor to indemnify the owner "only to the extent" of the negligent acts or omissions of the contractor, but also adds that the contractor's indemnification obligation will be excused if the loss is due "in any part" to the owner's negligence or other culpable conduct. Arnold et al., *supra* note 7.

indemnify the owner for 1% of that loss. This type of indemnity uses language that requires the contractor to indemnify the owner "only to the extent" of contractor's fault.

Due to the passage of anti-indemnity acts in the majority of United States jurisdictions, the utility of referencing the three categories described above during contract negotiation has declined. These anti-indemnity acts now generally deem void any indemnity requiring a contractor to indemnify an owner for the owner's own negligence.[9] This means that the broad form and intermediate form indemnities are often no longer enforceable.[10]

In any event, current energy industry practice no longer aligns with the legacy categories of broad, intermediate, and limited forms. In our experience, indemnification clauses in construction and services agreements now typically fall into one of three new categories:

- *Control-Based.* A control-based indemnity allocates risk for loss to the contractor, subject to the contractor's opportunity to prove that the loss was caused by the owner's negligence—in which case, the contractor's indemnification would be proportionately reduced to the extent of the owner's negligence. Under a control-based indemnity, the burden of proof generally rests on the contractor.
- *Fault-Based.* A fault-based indemnity allocates risk for loss to the contractor to the extent that the owner can prove that the contractor was at fault for such loss. Under a fault-based indemnity, the burden of proof generally rests on the owner.
- *Knock-for-Knock (No Fault).* A knock-for-knock indemnity allocates risk based on the identity of the party experiencing the loss, regardless of which party was at fault. Each party bears its own losses, irrespective of whether another party's negligence may have caused them. Under a knock-for-knock indemnity, burden of proof is irrelevant since it does not matter which party was at fault.

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9. TEX. INS. CODE ANN. § 151.102 (2012) ("[A] provision in a construction contract . . . is void and unenforceable as against public policy to the extent that it requires an indemnitor to indemnify, hold harmless, or defend a party . . . against a claim caused by the negligence or fault . . . of the indemnitee . . . ."); CAL. CIV. CODE § 2782(a) (West 2012) ("[P]rovisions . . . contained in . . . any construction contract and that purport to indemnify the promisee against liability for damages for death or bodily injury to persons, injury to property, or any other loss, damage or expense arising from the sole negligence or willful misconduct of the promisee . . . are against public policy and are void and unenforceable . . . ."); N.Y. GEN. OBLIG. LAW § 5-322.1(1) (McKinney 2023) ("A covenant . . . in . . . [a construction contract] purporting to indemnify or hold harmless the promisee against liability for damage arising out of bodily injury to persons or damage to property contributed to, caused by or resulting from the negligence of the promisee . . . is against public policy and is void and unenforceable . . . ."); LA. STAT. ANN. § 9:2780.1(B) (2018) ("[A]ny provision . . . contained in . . . a . . . construction contract which purports to indemnify, defend, or hold harmless . . . the indemnitee from or against any liability for loss or damage resulting from the negligence or intentional acts or omissions of the indemnitee . . . is contrary to the public policy of this state and is null, void, and unenforceable.").

10. TEX. INS. CODE ANN. § 151.102 (2012); *see* CAL. CIV. CODE § 2782(a) (West 2012); *see also* N.Y. GEN. OBLIG. LAW § 5-322.1(1) (McKinney 2023); *see also* LA. STAT. ANN. § 9:2780.1(B) (2018).

This article analyzes each of these indemnities and identifies the primary driver for selecting among them as the extent to which a contractor exercises control over the work site. We conclude by providing a simplified framework and matrix that can be used as a reference to determine which type of indemnity should be selected.

II. CONTROL-BASED INDEMNITIES: *RES IPSA LOQUITUR* AND THE PRESUMPTION OF FAULT

The distinguishing characteristic of a control-based indemnity is that the contractor bears the burden of proof to demonstrate that the owner is not entitled to receive indemnification, rather than the owner being required to prove the contractor's fault in order to receive indemnification. This paradigm is motivated by the same theoretical underpinnings of the common law principle known as *res ipsa loquitur,* which is Latin for "the thing speaks for itself."[11]

The English case *Byrne v. Boadle* first applied the doctrine of *res ipsa loquitur* in 1863.[12] As the plaintiff, Mr. Byrne, walked down a street, he was struck by a barrel of flour which fell from the defendant Mr. Boadle's flour shop window, injuring Byrne.[13] In his suit against Boadle for negligence, Byrne was unable to present any witnesses to establish that Mr. Boadle or any of his employees committed any negligent acts which caused the barrel of flour to fall.[14] The trial court applied a traditional formulation of the causation requirement (i.e., that the plaintiff had the burden of proof to demonstrate the defendant's negligence) and granted judgment for Boadle on the basis that no evidence had been presented by Byrne on the issue of causation.[15] On appeal, Byrne argued that although he was unable to present any witnesses to demonstrate Boadle's negligence, he should prevail in the negligence action anyway because Boadle and his employees were in control of the flour shop and barrels of flour generally do not fall from windows without some act of negligence causing the barrel to fall.[16] Byrne argued that in situations like these, the burden of proof should be on the defendant to demonstrate that no negligent acts had occurred, rather than upon the plaintiff to prove that the defendant committed a negligent act.[17]

The Exchequer Court agreed with Byrne that in the circumstances alleged, the defendant should have the burden of proof to demonstrate that he was not negligent.[18] Chief Baron Pollock explained:

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11. *Res Ipsa Loquitur*, MERRIAM-WEBSTER, https://www.merriam-webster.com/legal/res%20ipsa%20loquitur (last visited Mar. 2, 2023).

12. Byrne v. Boadle [1863] 159 Eng. Rep. 299.

13. *Id*.

14. *Id*.

15. *Id*.

16. *Id.*

17. *Id*.

18. *Id*.

> There are certain cases of which it may be said *res ipsa loquitur*, and this seems one of them. I think it would be wrong to lay down as a rule that in no case can presumption of negligence arise from the fact of an accident. Suppose in this case the barrel had rolled out of the warehouse and fallen on the plaintiff, how could he possibly ascertain from what cause it occurred? It is the duty of persons who keep barrels in a warehouse to take care that they do not roll out, and I think that such a case would, beyond all doubt, afford *prima facie* evidence of negligence. A barrel could not roll out of a warehouse without some negligence, and to say that a plaintiff who is injured by it must call witnesses from the warehouse to prove negligence seems to me preposterous. . . .[19]
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> . . . I think it apparent that the barrel was in the custody of the defendant who occupied the premises, and who is responsible for the acts of his servants who had the control of it; and in my opinion the fact of its falling is *prima facie* evidence of negligence, and the plaintiff who was injured by it is not bound to show that it could not fall without negligence, but if there are any facts inconsistent with negligence it is for the defendant to prove them.[20]

The fundamental basis for Chief Baron Pollock's opinion was the defendant's control of the flour shop and responsibility for the acts of his servants.[21] Pollock recognized that in analogous situations in which this legal principle might apply, the following circumstances would exist simultaneously: (i) it would be unlikely for the event to have occurred without the defendant's negligence; and (ii) the plaintiff would have a near-impossible task of obtaining truthful testimony from employees of the defendant.

The doctrine of *res ipsa loquitur* remains substantially the same today.[22] *Black's Law Dictionary* describes the circumstances under which application of the *res ipsa loquitur* principle is appropriate: "(1) the occurrence resulting in injury was such as does not ordinarily happen if those in charge use due care; (2) the instrumentalities were under the management and control of the defendant; and (3) the defendant possessed superior knowledge or means of information about the cause of the occurrence."[23]

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19. *Id.* The first known use of the term *res ipsa loquitur* (but in the form *res loquitur ipsa*) appeared in *Pro Milone*, a speech made by Marcus Tullius Cicero in 52 BC on behalf of his friend Titus Annius Milo who was accused of murdering his political enemy Publius Clodius Pulcher. Jeffrey Kahn & John Lopatka, *Res Ipsa Loquitur: Reducing Confusion or Creating Bias?*, 108 Kentucky L.J. 239, 245 n.29 (2019); *see What is Res Ipsa Loquitur?*, DIMARCO ARAUJO MONTEVIDEO (Apr. 24, 2018), https://www.damfirm.com/res-ipsa-loquitur/. As part of his defense of Milo, Cicero argued that political gangs who had taken control of the streets of Rome were responsible for the resulting injuries. While Chief Baron Pollock does not expressly cite Cicero's use of this legal maxim, it is assumed that Pollock was making reference to Cicero's original use in his opinion.

20. Byrne v. Boadle [1863] 159 Eng. Rep. 299.

21. *Id.*

22. For example, in Bond v. Otis Elevator Company, 388 S.W.2d 681 (Tex. 1965), a contractor installed and maintained an elevator under an agreement requiring it to indemnify the owner for losses arising from the contractor's negligence. *Id.* The Texas Supreme Court determined that both the owner and the contractor were liable to a plaintiff injured by the elevator due to their joint control of the instrumentality causing the injuries (but ultimately allocated liability to the contractor due to the contractual indemnity). *Id.; see* General Elevator Co. v. District of Columbia, 481 A.2d 116 (D.C. 1984) (accepting the principle that *res ipsa* type reasoning is useful in determining allocation of liability under a contractual indemnity, even when the principle of *res ipsa loquitur* does not technically apply under the specific facts at issue).

23. *Res ipsa loquitur*, BLACK'S LAW DICTIONARY (11th ed. 2019).

These circumstances parallel those commonly found on many energy projects. First, contractors have built hundreds of solar plants, thousands of wind turbines, and millions of miles of pipelines. Due to the repetitive nature of energy work by experienced contractors, major losses do not ordinarily occur without someone's negligence. Second, on such energy projects, it is usually the contractor that exercises management and control over the project site—and is therefore best positioned to prevent a loss. The owner's presence is limited to a small number of inspectors who act as mere observers and do not exercise control over the work. Third, almost all of the personnel with knowledge of causation for the loss are likely to be employees or subcontractors of the contractor.

Under a typical limited form (fault-based) indemnity, the owner is only entitled to receive indemnification for claims or losses "to the extent" of the contractor's fault. This means that the project owner may find itself in the same position as the unfortunate Mr. Byrne, who was struck by the falling barrel.[24] In circumstances where the contractor controls the work site (much like how Mr. Boadle controlled his flour shop), a typical fault-based indemnity may prohibit an owner from receiving any indemnification from the contractor due to a potentially insurmountable obstacle: the burden of proof.[25]

We recently witnessed a modern version of *Byrne v. Boadle* on a compressor station project. During the course of construction, hundreds of contractor personnel came on and off the site, while only a handful of owner personnel were present (e.g., a site inspector and an owner representative). The contractor supplied and installed thousands of small steel fasteners, each easily identifiable by their shape and color. Near the conclusion of the project, the contractor initiated the commissioning and startup procedure to test a newly-installed compressor turbine. Upon initial startup of the turbine, a discordant sound emanated from the turbine, and the contractor immediately shut down the turbine to investigate the cause of the noise. After opening up the damaged turbine, personnel recovered a small fastener of the same shape and color as those used by the contractor. The fastener had apparently fallen or been kicked into the compressor station piping by accident and then had been sucked into the turbine upon startup. When the owner invoked the contractual indemnity to receive reimbursement for damage to the turbine, the contractor argued that the owner must provide eyewitness or video evidence of contractor personnel knocking or dropping the fastener into the compressor station piping. But the owner had no such evidence.

One purpose of a control-based indemnity is to avoid such results. The owner should not be responsible for bearing risks that are within the control of the contractor—such as the care and handling of fasteners. A control-based indemnity generally includes language as shown below:[26]

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24. Byrne v. Boadle [1863] 159 Eng. Rep. 299.

25. *Id.*

26. We have noticed that while students and practitioners may understand and correctly describe the conceptual differences between types of indemnities, they often struggle to classify specific indemnity language into its proper category. We provide this simplified example language to assist the reader in linking the concepts discussed herein to contractual language that allows those concepts to become operative. This language is

> Contractor shall Indemnify[27] Owner Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of the Work or any member of Contractor Group's actions or inactions under this Agreement. Notwithstanding the foregoing, Contractor's Indemnification obligation shall be reduced in accordance with principles of comparative responsibility to the extent that Contractor proves that Owner Group's negligence, gross negligence, or willful misconduct caused such claims or losses.

Because such a control-based indemnity does not require a contractor to indemnify the owner for the owner's own negligence, the provision is presumptively consistent with anti-indemnity statues in the United States.[28] Even in the absence of an anti-indemnity statue, the contractor should not be asked to indemnify an owner for events that are the fault of the owner—which itself results in economic inefficiency arising from the contractor being forced to make assumptions about the degree of care that will be exercised by the owner and structure its bid accordingly.

Circumstances where a third party is at fault for some or all of a loss can complicate control-based indemnities. In our practice, we have seen four general approaches to resolving this issue:

- *Contractor Indemnifies Owner for All Third-Party Responsibility.* Under this first approach, the contractor indemnifies the owner for the proportion of fault attributable to the third party. The rationale for this approach is that the party in control (the contractor) is allocated this risk and is thereby appropriately incentivized to implement precautions to minimize third-party losses (e.g., by providing an off-duty police officer to direct traffic at the site entrance). This approach does not prohibit the contractor from seeking reimbursement from responsible third parties or insurance policies.[29]
- *No Indemnity of Owner for Losses Caused by Third Parties.* Under this second approach, the owner does not receive indemnification for losses to the extent that the contractor can demonstrate such losses were caused by third parties. The rationale for this approach is that the contractor may have little or no power to avoid or mitigate the actions of third parties and that allocating the risk of third-party negligence to the contractor will not serve to affect incentives in a meaningful way.
- *Contractor Indemnifies Owner Unless Contractor Fault is Zero.* Under this third approach, the contractor indemnifies the owner for

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simplified and abbreviated and should not be considered "model" language. For example, a control-based indemnity may also include a process by which the owner agrees to refund to contractor a percentage of advanced defense costs—to the extent the contractor demonstrates that owner negligence contributed to the loss.

27. Indemnify is defined to include both costs of defense and costs of indemnification.

28. Note that anti-indemnity case law remains poorly developed. For example, the Texas Anti-Indemnity Act became effective on January 1, 2012, but the first cases substantively interpreting the Act did not appear until 2022. *See* Signature Indus. Servs. v. Int'l Paper Co., 638 S.W.3d 179 (TEX. 2022). We are currently unaware of any case law holding that a control-based indemnity is unenforceable under the applicable anti-indemnity statute.

29. To avoid double recovery, the contractor's indemnification obligation is reduced to the extent that the owner receives insurance proceeds from a Builder's All-Risk policy in respect of the loss. However, this does not excuse the contractor from indemnifying the owner while the insurance claim is pending.

the proportion of fault attributable to the third party unless the contractor can demonstrate that it had zero responsibility for the loss. The rationale for this third approach is similar to the second approach, except here the parties assume that the contractor will have at least some power to avoid or mitigate the actions of third parties (e.g., by placing warning signals near the site entrance). However, some third-party actions will occur regardless of the contractor's efforts to avoid third-party losses (e.g., a reckless driver traveling at twice the speed limit), and in these circumstances placing responsibility for the loss on the contractor would not decrease the probability of the loss occurring.

- *Contractor Indemnifies Owner for Half of Third-Party Responsibility.* Under this fourth approach, the owner and contractor share the risk of third-party negligence equally. This may be viewed as a "fair" approach because it makes the owner and contractor equally responsible for losses which may be outside the control of either party while still preserving the incentive for the contractor to implement safeguards and controls to prevent losses.

The distinguishing characteristic of the control-based indemnity is that the contractor bears the burden of proof regarding the comparative negligence of others, on the basis that the contractor controls the site where the work is occurring. The practical application of a control-based indemnity results in temporary indemnification of the owner until investigation into causation concludes. If the investigation shows that a member of the owner group (or, in the variations discussed above, a third party) was wholly or partially responsible for the loss, the owner must proportionally reimburse the contractor for amounts previously paid to the owner.[30]

In our experience, the control-based indemnity is the predominant form of indemnity both at greenfield projects (i.e., those locations that do not require working in and around existing owner facilities) and at contractor-controlled work locations within an existing owner facility (i.e., where the contractor has the ability to restrict the presence of non-contractor personnel other than the owner's representative and inspectors). The principal rationale is similar to that of *res ipsa loquitur*. Owners of energy projects hire contractors with track records of successfully constructing similar facilities. These expert contractors execute the work

30. Whether a contractor is obligated to defend and indemnify an owner against certain claims may depend upon interpretation of the relevant anti-indemnity statute. For example, the Texas Supreme Court recently interpreted the Texas anti-indemnity statute to rule against an owner's attempt to obtain certain defense costs from its contractor. *Signature Indus. Servs.*, 638 S.W.3d 179. The contractor had been performing maintenance and construction work for the owner before the parties became embroiled in a payment dispute. *Id.* at 184. The contractor alleged that the owner's failure to pay caused it to miss required tax payments. *Id.* at 185. As the contractor's financial situation deteriorated, the contractor's president (who had personally guaranteed certain loans to the contractor) also sued the owner directly. *Id.* at 185-86. The owner then sought indemnification from the contractor against the president's claim under the contract's control-based indemnity. *Signature Indus. Servs.*, 638 S.W.3d 179. The Court explained that while the "true cause" of the president's personal liability may have been the contractor's failure to pay taxes, the Texas anti-indemnity statute only asks whether the "claim" for which indemnity is sought was "caused by" the fault of the indemnitee, and that this determination could be made on the basis of the pleadings without additional factual inquiry. *Id.* at 195.

using their own hand-picked personnel and subcontractors. The owner typically maintains minimal oversight of day-to-day work. Therefore, if something goes wrong, it is likely to be the contractor's fault—and the control-based indemnity protects the owner from finding itself in a position where its limited site presence makes it difficult to prove negligence.

The control-based indemnity also may serve as a screening mechanism for energy project owners to sort contractors based on their level of comfort with the proposed project. In the process of reviewing redlines to construction agreements by contractors, we have noticed a correlation between a contractor's level of experience with similar projects in the same geographic area and whether or not such contractor is willing to accept a control-based indemnity. The less experience a contractor has with a given type of energy project in the relevant geographic area, the riskier it is for a contractor to accept a control-based indemnity. Even if indemnification is rarely invoked, an owner may benefit from using the control-based indemnity to screen out those contractors with lower experience levels, and suitable contractors may benefit by using their acceptance of the control-based indemnity to differentiate themselves from less-experienced competitors.

III. FAULT-BASED INDEMNITIES: ENSURING RECOVERY OF LEGAL COSTS

The distinguishing characteristic between the control-based indemnity and the fault-based indemnity is which party bears the burden of proof. Under the control-based indemnity, the contractor bears the burden to prove that the owner (or in some cases, a third party) was responsible for all or part of the loss. Under the fault-based indemnity, it is the owner that must carry the burden of proof and demonstrate that the contractor was responsible for all or part of the loss. A fault-based indemnity is integrated into a construction or services agreement using language similar to the following:

> Contractor shall Indemnify Owner Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of the Work or any member of Contractor Group's actions or inactions under this Agreement, but only to the extent caused by the negligent acts or omissions of Contractor Group, and shall defend Owner Group from any suit or action brought against Owner Group founded upon the allegation of any such claim or loss.

Like the control-based indemnity and its theoretical foundation in the common law principle of *res ipsa loquitur*, the fault-based indemnity is also rooted in common law principles. Depending on the jurisdiction, an obligation for one party to indemnify another may arise under (1) an "express contractual indemnity," (2) an "implied contractual indemnity," or (3) an "equitable implied indemnity."[31] Express contractual indemnities are "derived from specific language of a contract where one party expressly promises to indemnify the other for a particular kind of loss," while an implied contractual indemnity "arises where a duty to indemnify may be implied from a contractual relationship between two parties."[32] As two industry observers explained:

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31. Sherri L. Sweers & Thomas B. Quinn, *The Law of Indemnity in Wyoming: Unravelling the Confusion*, 31 LAND & WATER L. REV., 811, 811-12 (1996).

32. *Id.* at 813-14.

> The historical bases of indemnity are the related legal theories of unjust enrichment and restitution. At least as to comparative equitable indemnity, and to some degree implied contractual indemnity, courts have determined that it would be unfair for one of several parties causing damage to another to be 'unjustly enriched' by not having to compensate the injured party for the damage that they did cause, and allowing for restitution to the party that actually did pay. In other words, if you were partly responsible for damage that somebody else paid for, it's only fair that you pay them back.[33]

A contractual relationship between an owner and a contractor is one where an indemnity may be implied:

> Typically, [an implied contractual indemnity] action stems from a breach of contract between the two parties where the indemnitor agreed to perform services. The agreement implied an obligation to do the work in a proper manner and to discharge damages resulting from an improper performance. For example, in [a Wyoming Supreme Court case], the engineering company built a heating system for the architect of an instructional facility under an oral subcontract. The heating system's failure to meet specifications caused the architect to pay additional costs. The architect sued the engineer for indemnity for the financial settlement he had to pay.[34]

If such claims are already available as a matter of law, then what is the purpose of a fault-based indemnity? While an owner may be able to make a common law indemnification claim against its contractor, a properly drafted indemnification clause will also allow the owner to recover certain types of losses, such as "attorney's fees, which are not typically recoverable under a common law cause of action."[35] However, even when the contract contains a fault-based indemnity provision, questions may arise regarding the scope of the contractor's duty to defend.[36]

Some fault-based indemnities provide for a refund of defense costs, to the extent that the contractor is not found to be at fault.[37] Others do not. For example, in *English v. BGP Intern., Inc.*, a project owner hired a contractor to conduct seismic exploration activities on "land owned by approximately 15,000 different parties."[38] After the contractor commenced exploration activities without first obtaining the permission of certain landowners, the landowners named both owner and contractor in lawsuits alleging trespass and negligence.[39] The contractor refused the owner's request for defense against the lawsuits, insisting that it did not owe a

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33. Theodore D. Levin et al., *An Overview of Indemnification and the Duty to Defend*, AM. COUNCIL OF ENG'G COMPANIES 1, 2 (2014), https://docs.acec.org/pub/DA77E02A-C742-9915-1727-73DF2CCC23B9.

34. Sweers & Quinn, *supra* note 31, at 815 (describing the facts in Kemper Architects, P.C. v. McFall, Konkel & Kimball Consulting Engineers, Inc., 843 P.2d 1178 (Wyo. 1992)).

35. *Indemnification Clauses in Commercial Contracts*, THOMPSON REUTERS, https://legal.thomsonreuters.com/en/insights/articles/indemnification-clauses-in-commercial-contracts (last visited Mar. 10, 2023).

36. Levin et. al., *supra* note 33. "The obligation to defend is broader than the obligation to indemnify because it applies regardless of the merits of the third-party suit. The allegations of the lawsuit trigger the obligation to defend, not the ultimate disposition of the case." *Indemnification Clauses in Commercial Contracts*, *supra* note 35.

37. *Indemnification Clauses in Commercial Contracts*, *supra* note 35.

38. English v. BGP Intern., Inc., 174 S.W.3d 366, 369 (Tex. App. 2005).

39. *Id.*

duty to defend unless the owner demonstrated that the contractor was negligent.[40] The relevant indemnity provision required the contractor to

> protect, defend, indemnify and hold harmless [the owner] . . . against loss or damage arising out of any claim or suit . . . resulting from operations when [the contractor] . . . commence[s] field operations without the [consent of all landowners] or any claim or suit arising out of the negligent actions or omission of [contractor].[41]

In determining that the contractor owed a duty to defend, the court emphasized that "the duty to defend and duty to indemnify are distinct and separate duties," and that "the duty to defend is determined solely by the precise language in the contract and the factual allegations in the pleadings."[42]

In most cases, however, the contractor's indemnity is not applicable to the extent that anyone other than a member of "Contractor Group" (which includes contractor, contractor's personnel, contractor's subcontractors, and such subcontractors' personnel) caused the claim or loss. Consider a hypothetical vehicle accident at the site gate involving a contractor vehicle, an owner vehicle, and a third-party vehicle in which each of the drivers was found to be one-third negligent. The contractor's indemnity would usually only extend to its own driver's negligence. The result is that the contractor's indemnity of the owner would be for one-third of the owner's defense costs, claims, and losses arising from such accident.

One potential inefficiency of using a fault-based indemnity (rather than a control-based or knock-for-knock indemnity) is the inherent uncertainty in determining *ex ante* whether the contractor or the owner will bear the costs of a hypothetical loss. As John Collins and Denis Dugan explained almost 60 years ago, "[t]he problem of allocating the cost of injuries and property damage incurred on premises during the time work is being performed by contractors . . . presents, at base, a question of insuring against the risks and of who buys the insurance."[43] Because a fault-based indemnity leaves the owner susceptible to losses actually caused by the contractor's actions or inactions (but causation of such losses may be impossible to demonstrate), both the owner and contractor are at risk of bearing the loss and therefore incur a duplication of costs if both choose to insure against the same loss.[44]

In our practice, we typically see fault-based indemnities where the contractor does not exercise management and control over the project site. For example, the

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40. *Id.* at 369, 375-76.

41. *Id.* at 369.

42. *BGP Intern., Inc.,* 174 S.W.3d at 371-72 (quoting Farmer's Tex. County Mut. Ins. Co. v. Griffin, 955 S.W.2d 81, 82 (Tex. 1997). *See* Tesoro Petroleum Corp. v. Nabors Drilling USA, Inc., 106 S.W.3d 118, 125 (Tex. App. 2003) ("The duty to defend may be triggered by the pleadings, but the duty to indemnify is based on the jury's findings.").

43. John R. Collins & Denis W. Dugan, *Indemnification Contracts – Some Suggested Problems and Possible Solutions*, 50 MARQ. L. REV. 77, 84-85 (1996).

44. *Id*. at 85 (describing a similar outcome when an indemnity clause is unnecessarily vague: "One problem with a general form of indemnification which does not make explicit whether it is to provide indemnification in cases where the owner's negligence allegedly causes or joins in causing the damages, is that there is likely to be double insurance coverage with consequent duplication of cost.").

owner could have two construction contractors working at the same site, each performing a different type of work. By way of further example, a contractor may be asked to work within a running facility, among the owner's operational personnel. In such cases, *res ipsa loquitur* principles are no longer applicable because it is unfair to presume a given contractor is at fault for a loss. Such loss is equally likely to have been caused by another contractor or one of the owner's employees.[45]

IV. KNOCK-FOR-KNOCK INDEMNITIES: NO-FAULT

A knock-for-knock indemnity is a mutual indemnity where each party contractually assumes liability for injuries and damages to its own employees, contractors, subcontractors, and property, regardless of the fault or cause of the injury or damage.[46] Under this type of indemnity, also called an "identity-based indemnity," the parties agree to accept liability for injury or damage to their own personnel or property, even when the party suffering the loss can demonstrate that the loss occurred due to the fault of another party.

A knock-for-knock indemnity is integrated into a construction or services agreement using reciprocal language similar to the following:

> Contractor shall Indemnify Owner Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of bodily injury, illness, or death of any member of Contractor Group [or property damage to any property of Contractor Group],[47] whether caused by the sole or concurrent negligence or fault of any member of Owner Group, which arise out of or relate to the Work.
>
> Owner shall Indemnify Contractor Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of bodily injury, illness, or death of any member of Owner Group [or property damage to any property of Owner Group], whether caused by the sole or concurrent negligence or fault of any member of Contractor Group, which arise out of or relate to the Work.

45. Stanley A. Martin & Leah A. Rochwarg, CONSTRUCTION LAW HANDBOOK § 28.04(A) (2018). Negligence-based indemnities also may be appropriate for subsets of claims in certain circumstances, such as: (i) claims related to defects in owner-provided designs, (ii) claims related to defects in owner-supplied materials, and (iii) claims that occur years after completion (in which the owner's maintenance practices could have caused the loss). These examples are similarly consistent with the principle of the degree of contractor's control being the determining factor.

46. Russell E. Jumper & Timothy J. Fandrey, *General Contractor Clauses: Knock-for-Knock Indemnification*, THOMSON REUTERS PRACTICAL LAW (2021); *see* In re Deepwater Horizon, 470 S.W.3d 452, 456 n.5 (Tex. 2015).

47. Some anti-indemnity statutes allow knock-for-knock indemnities for personal injury but not for property loss. For example, the Texas Anti-Indemnity Act "does not apply to a provision in a construction contract that requires a person to indemnify, hold harmless, or defend another party to the construction contract or a third party against a claim for the bodily injury or death of an employee of the indemnitor, its agent, or its subcontractor of any tier." TEX. INS. CODE § 151.103 (2012).

The primary advantage of knock-for-knock indemnification is certainty regarding which party is responsible for which losses.[48] Under a knock-for-knock approach, litigation costs are reduced or avoided because it does not matter who caused the loss—it only matters who experienced the loss.[49] Such certainty provides additional cost savings by reducing the potential overlap in insurance policies procured by the various parties.[50] Under such an identity-based approach, the responsibility for a loss is clear and risk is predictably allocated at the time of contracting. This means that insurance coverage only needs to be obtained for a party's own property and personnel (and not also for losses that could be inflicted on others).

Knock-for-knock indemnities also may increase transparency between the parties regarding mitigation of risks.[51] Under a control-based or fault-based indemnity, a party may seek to shift the responsibility for a loss to the other party, especially when the loss is substantial. This attempted loss shifting generally plays out through costly litigation or arbitration, where each party has an incentive to obscure or distort the cause(s) of a loss because establishing actual causation determines responsibility for the loss. This situation presents a prisoner's dilemma, whereby each party's self-interest is served by attempting to lay blame on the other party, but the mutual interests of all parties would be best served by identifying the true cause of the loss to ensure it does not reoccur. An identity-based, knock-for-knock regime provides a solution for this prisoner's dilemma because it removes causation as the determining factor for allocating responsibility. Because the parties know that responsibility for a loss remains fixed regardless of who caused the loss, information sharing and development of best practices are encouraged. For example, we witnessed a case where a contractor continued to attempt to remedy a collapsed tunnel (throwing good money after bad) in an effort to escape liability under an indemnification clause—when it would have been in everyone's best interest to abandon the tunnel and proceed with an alternative route. Under a knock-for-knock regime, the contractor may have avoided such expenditures.

Despite these advantages, the knock-for-knock indemnity has a significant downside—the unappealing result of an innocent party potentially bearing the costs of another's negligence.[52] Knock-for-knock indemnities may also contribute to moral hazard by failing to create proper incentives for contractual parties to avoid the imposition of losses on others. This moral hazard may be exacerbated

48. Robert Meade & Nicholas Neuberger, *Knock-for-Knock Indemnities: Risk Allocation in Offshore Oil and Gas Contracts*, LEXISNEXIS (2019), https://bracewell.com/news/knock-knock-indemnities-risk-allocation-offshore-oil-and-gas-contracts.

49. *Id*.

50. *Id*.

51. *Id*.

52. Indeed, even jurisdictions that permit knock-for-knock indemnities acknowledge their imperfect nature. In an English case involving a tugboat accident, the court described the knock-for-knock indemnity between the litigants as "a crude but workable allocation of risk and responsibility" given the reality that "happenstance" would otherwise often determine who should be liable. Smit v. Mobius [2001] EWHC (Comm) 531 [19] (Comm) (Eng.).

when a contractor is faced with time or cost pressure. In such cases, a contractor may select means or methods that introduce additional risks to others but minimize time or cost. By contrast, under a control-based or fault-based indemnity, a contractor would be less likely to "cut corners" in order to finish a task in a shorter period of time or at a lower cost, because the potential losses (for which it would owe an indemnity) would far outweigh any gain the contractor would receive.

Due in part to these considerations, many jurisdictions have restricted or prohibited the use of knock-for-knock indemnities on public policy grounds.[53] For example, the Texas Construction Anti-Indemnity Act renders void and unenforceable a contractual provision to the extent that it requires one party to indemnify another against a property[54] loss claim caused by the negligence or fault of the indemnitee. By contrast, the Texas Oilfield Anti-Indemnity Act provides an exception for agreements which provide indemnification for claims caused by the indemnitee's own negligence if the indemnity obligation is supported by liability coverage furnished by the indemnifying party.[55] As a result, whether a knock-for-knock indemnity is enforceable under Texas law will depend in part on whether the Construction Anti-Indemnity Act or the Oilfield Anti-Indemnity Act applies to the indemnity and the character of the particular losses indemnified.[56]

Where knock-for-knock indemnities are permitted by applicable law, the benefits of identity-based indemnification generally only prevail when multiple parties with large numbers of personnel and equipment are all occupying the same work location—with little or no delineation between work areas and no clear control of the worksite by a single party.[57] In these circumstances, a control-based

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53. *See* TEX. INS. CODE ANN. § 151.102; CAL. CIV. CODE § 2782(a); N.Y. GEN. OBLIG. LAW § 5-322.1(1); LA. STAT. ANN. § 9:2780.1(B).

54. TEX. INS. CODE ANN. § 151.102. Note that the Texas Anti-Indemnity Act provides an exception for bodily injury or death claims for employees of the indemnitor and permits indemnity for the sole or partial negligence or fault of the indemnitee for those claims only. *Id.* § 151.103.

55. TEX. CIV. PRAC. & REM. CODE ANN. § 127.005 (West 1999). *See* Russell E. Jumper & Timothy J. Fandrey, *General Contract Clauses: Knock-for-Knock Indemnification Provision (TX)*, PRACTICAL LAW (Dec. 15, 2021), https://content.next.westlaw.com/practical-law/document/I7bf17e0c36cd11e99687ad62ac048e9b/General-Contract-Clauses-Knock-for-Knock-Indemnification-Provision-TX?viewType=FullText&transitionType=Default&contextData=(sc.Default) ("Texas . . . has carved out an exception . . . that allows parties to use an indemnity provision if the provision is supported by certain liability insurance coverage"); Thomas A. Donaho, *Texas Oilfield Indemnity Handbook* 8-10, BAKERHOSTETLER, https://www.bakerlaw.com/webfiles/Litigation/2019/Articles/06-19-2019-Texas-Oilfield-Indemnity-Handbook.pdf (explaining the insurance coverage exception in the Texas Oilfield Anti-Indemnity Act).

56. Amy K. Wolfshohl & Cornelius M. Sweers, *Engineering, Procurement, and Construction Contracts in Texas: Key Provisions, Issues and Pitfalls*, 17 CONSTR. L.J. 6, 23 (2021) ("[W]hen the [Texas Oilfield Anti-Indemnity Act] does not apply to a construction project, the [Texas] Construction Anti-Indemnity Act applies and would render a [Texas Oilfield Anti-Indemnity Act] knock-for-knock indemnity provision at least partially unenforceable.").

57. Alex Johnson, *Indemnities in Offshore Construction Projects – Do Not Be Shocked by Knock for Knock* 1-2, SQUIRE PATTON BOGGS (2016), https://www.squirepattonboggs.com/~/media/files/insights/publications/2016/09/construction-and-engineering-update-autumn-2016/construction-and-engineering-update-autumn-2016.pdf. "'[K]nock for knock' indemnities (assuming they are well crafted, precise, and clear) are likely to be upheld by English courts and however crude the arrangement might seem, the courts seem to accept that it does offer some certainty in an extremely risky work environment." *Id.* at 3.

indemnity is unworkable because no single party controls the work site and thus the underlying principle of *res ipsa loquitur* does not apply. Likewise, a fault-based indemnity regime may be impractical due to the high cost of demonstrating causation due to the number of potential parties and instrumentalities involved.[58]

Knock-for-knock indemnities have historically been observed in contracts governing work on offshore oil and gas platforms because this work environment is the most likely to be characterized by many parties operating simultaneously in a work area that is not wholly controlled by any single party.[59] In the litigation occurring in the aftermath of the 1988 Piper Alpha oil platform explosion, Lord Bingham described the motivation for the "market practice" of using knock-for-knock indemnities:

> Operations to exploit the oil and natural gas resources of the North Sea have two prominent features relevant for present purposes. First, such operations are potentially hazardous . . . The second feature worthy of note is the involvement of many contractors and sub-contractors . . . [T]he Piper Alpha disaster led to claims against 24 different contractors. Of those on board the platform who were killed, 134 were employed by contractors and 31 by the operator. Of those who survived, 55 were employed by contractors and 6 by the operator.[60]

However, a knock-for-knock indemnity is not automatically appropriate for all offshore work. For example, it is erroneous to argue that a knock-for-knock indemnity should apply to an offshore construction project being undertaken by a single general contractor who is in control of the platform or vessel where the work is occurring. In such cases, the many subcontractors are part of the general contractor's "group," and therefore a control-based indemnity by the general contractor would be appropriate. Thus, rather than merely assuming that "offshore scope of work" automatically implies a knock-for-knock indemnity, practitioners should consider whether a control-based or fault-based indemnity would result in a more appropriate allocation of risk.

Because identity-based indemnities involve mutual indemnification for losses between the contracting parties, these indemnities generally do not address third-party claims or losses. Instead, when an identity-based indemnity is implemented, third-party claims and losses are generally handled via a fault-based indemnification provision whereby each contracting party indemnifies the others for third-party claims and losses to the extent of the indemnitor's negligence.

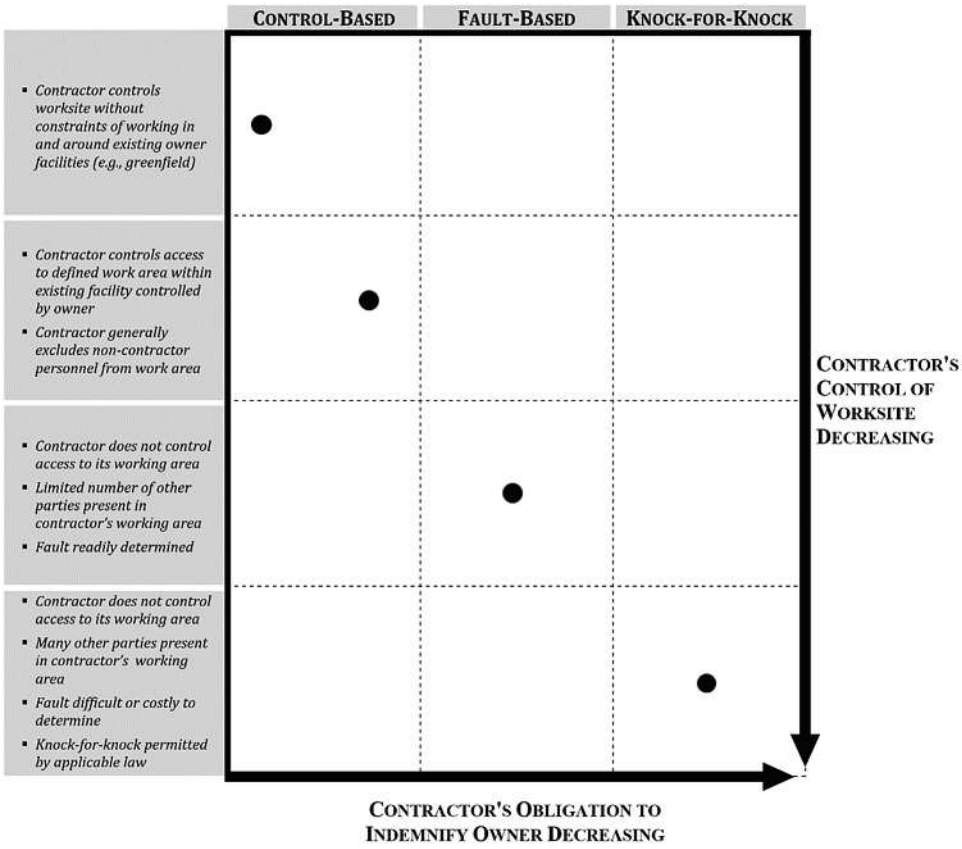
58. Caledonia North Sea Ltd. v. British Telecomms. Plc [2002] UKHL 4.

59. Patrycja Mielcarek, *The Knock-for-Knock Agreements in the Offshore Sector Under the United States and Norwegian Law: The Problem of Gross Negligence and Willful Misconduct* (2012) (on file with U. of Oslo Faculty of Law).

60. Caledonia North Sea Ltd. v. British Telecomms. Plc [2002] UKHL 4.

V. INDEMNITY SELECTION MATRIX: USING DEGREE OF CONTROL TO SELECT THE PROPER INDEMNITY

On any given energy project, the contractor's relative level of control over the work site will exist somewhere along a continuum. Certain project circumstances allow the contractor to exercise near-complete control over the work site, with nearly all on-site personnel either employees or subcontractors of the contractor. By contrast, other projects require contractor personnel to undertake work alongside dozens of unrelated contractors with no clear delineation between work areas. Each of these circumstances—and those existing in between—calls for application of an indemnity paradigm designed to balance incentive alignment against economic inefficiency. The matrix below illustrates this continuum of control and the type of indemnity that strikes the appropriate balance between these trade-offs. Note that as the contractor's control over the worksite decreases, its obligation to indemnify the owner similarly decreases:



VI. CONCLUSION

Selecting contractual indemnities in energy construction and services agreements has become increasingly difficult due to confusion among practitioners re-

garding when certain types of indemnities are appropriate. This difficulty is further compounded by the general inapplicability of historical indemnification categories to the types of indemnities typically being used in construction and services agreements. By moving toward consideration of indemnities as control-based, fault-based, or identity-based (knock-for-knock), owners and contractors can more efficiently allocate the risk of losses using indemnification principles based primarily on relative control over the contractor's working area. In doing so, a contractor bears the burden of proving the owner's negligence when the contractor has sole control over a location, an owner bears the burden of proving the contractor's negligence when the owner allows a contractor to work in and around owner personnel or other contractors, and everyone bears their own losses when there are many parties working alongside each other.

A CLARIFICATION ON FERC'S DISCRETION IN FINDING JUST AND REASONABLE RATES IN THE ELECTRICITY MARKET: PUBLIC CITIZEN, INC. V. FERC

I. INTRODUCTION

In *Public Citizen, Inc. v. FERC* (*Public Citizen*), the United States Court of Appeals for the D.C. Circuit unanimously held that the Federal Energy Regulatory Commission (FERC or Commission) decision to uphold Midcontinent Independent System Operator's (MISO) 2015 Electricity Capacity Auction results was arbitrary and capricious.[1] The auction resulted in prices for a regional zone, covering

1. Pub. Citizen, Inc. v. FERC, 7 F.4th 1177 (D.C. Cir. 2021).

most of Illinois, forty times higher than neighboring zones.[2] This price anomaly ultimately led to several parties filing complaints at FERC under section 206 of the Federal Power Act (FPA).[3] FERC agreed that the auction rules were producing unreasonable price spikes and ordered prospective changes as well as a separate investigation into possible market manipulation.[4] But it declined to call into question the 2015 auction results themselves and also closed its investigation without bringing an enforcement action against any market participants.[5] It was the FERC's denial of relief with respect to the 2015 auction results and its decision to close the investigation that prompted the complainants' appeal.[6]

The Court ultimately remanded the case to FERC to provide an explanation for determining that the 2015 Auction results were just and reasonable, rejecting FERC's "breezy" analysis on this question as arbitrary and capricious.[7] But the Court also held that it could not review FERC's separate decision to close its market manipulation investigation.[8] Further, and most crucially, the Court held that under section 205 of the FPA FERC is not required to review individual electricity prices for justness and reasonableness before they go into effect where those prices were set as part of an auction whose market-based methodology FERC approved as just and reasonable and where FERC is conducting continual oversight of the functioning of a market-based tariff.[9]

This case note will first discuss the relevant background surrounding the history of the FPA and FERC's administration of the FPA, the just and reasonable electricity rate requirement, and the prohibition of market manipulation within the electricity industry. As further background, the note will discuss MISO's 2015 Capacity Auction, market-based rate tariffs, FERC's involvement with regulating electricity markets, and judicial review of FERC orders. Finally, this note will provide the procedural history of the relevant FERC Orders, an analysis of each of the D.C. Circuit's holdings, and an analysis of whether the Court was correct in not requiring the Commission to approve each individual market-based price for electricity capacity when it had already approved the underlying market-based rate setting methodology producing those prices as just and reasonable.

2. *Id.* at 1182.
3. *Pub. Citizen, Inc.*, 7 F.4th 1177.
4. *Id.*
5. *Id.* at 1190-91.
6. *Id.* at 1182.
7. *Pub. Citizen, Inc.*, 7 F.4th at 1200.
8. *Id.* at 1195-96. *See* Heckler v. Chaney, 470 U.S. 821 (1985) (*Chaney*); 5 U.S.C. § 701(a)(2) (2011).
9. *Pub. Citizen, Inc.*, 7 F.4th at 1193-95.

II. BACKGROUND

A. A Broad Overview of the Federal Power Act and FERC's Creation

To combat "abuses of market power" evident in 1935, Congress enacted the Public Utility Act.[10] Contained within Title II of the Public Utility Act was the first iteration of the FPA.[11] The FPA authorized the Federal Power Commission to govern transmission and wholesale sales of electric energy and natural gas in interstate commerce.[12] Years later, Congress passed the Department of Energy Organization Act of 1977, and a newly created administrative agency, FERC was established.[13] Concurrently with the establishment of FERC, the authority to regulate the wholesale transmission and sale of electricity was transferred from the Federal Power Commission to FERC.[14] FERC's mission, in part, is to "assist consumers in obtaining . . . secure energy services at a reasonable cost through appropriate regulatory and market means."[15]

FERC's authorities and responsibilities within the electricity industry encompass jurisdiction over "the transmission of electric energy in interstate commerce and . . . the sale of electric energy at wholesale in interstate commerce."[16] Accordingly, FERC does not have jurisdiction over intrastate transmission and sales of electric energy, which is instead left to individual States to regulate.[17]

Congress amended the FPA by passing the Energy Policy Act of 2005 (EPAct), which expanded the FERC's responsibilities to include the authority to "issue rules to bar market manipulation" and the authority to impose civil penalties to entities that participate in the market manipulation.[18] As seen in subsequent FERC decisions, the Commission has used this expanded authority to regulate market manipulation in the wholesale electricity market in particular.[19]

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10. Richard J. Campbell, *The Federal Power Act (FPA) and Electricity Markets* 2, CONG. RES. SERV., (2017), https://crsreports.congress.gov/product/pdf/R/R44783. The need to regulate the electric power industry was evident, as electric power companies were notably dominating the industry by practicing interstate activities where no federal regulations existed, and state jurisdiction could be avoided. *Id.* at 1-2.

11. *Id.* Originally titled the "Federal Water Power Act" in 1920, the FPA broadened the scope of its federal regulatory authority to reach natural gas, electricity, and hydroelectric interstate activities. *See* 16 U.S.C. § 824-824g (2015).

12. 16 U.S.C. § 824(b)(1).

13. Department of Energy Organization Act of 1977, Pub. L. No. 95-91, 91 Stat. 565 (1977) (amended 1978). In the wake of nonrenewable energy shortages, the Department of Energy Organization Act of 1977 consolidated Federal energy activities and "provided the framework for a comprehensive and balanced national energy plan." *A Brief History of the Dep't of Energy*, DEP'T OF ENERGY, https://www.energy.gov/lm/doe-history/brief-history-department-energy.

14. THE FEDERAL POWER ACT (FPA) AND ELECTRICITY MARKETS, *supra* note 7, at 3. It has been cited that this transition took place in part because of the public scrutiny surrounding the FPC's efficiency. *Id.*

15. *About FERC*, FERC, https://www.ferc.gov/what-ferc#.

16. 16 U.S.C. § 824(b)(1).

17. *Id.*

18. FERC, FERC & EPACT 2005: MEETING MILESTONES 4 (2006) https://www.ferc.gov/sites/default/files/2020-04/ferc-and-epact-2005.pdf.

19. *Barclays Bank PLC*, 144 FERC ¶ 61,041 at P 36 (2013).

B. The Just and Reasonable Electricity Rate Requirement

FERC's authority over electricity rates in interstate commerce is set forth in sections 205 and 206 of the FPA, which not only mandate that prices charged for electricity rates are "just and reasonable," but also set forth filing requirements for public utilities and provide the Commission with the power to review rates charged for electricity.[20] Section 205 of the FPA concerns new or prospective electric rates and requires that "[a]ll rates and charges . . . for or in connection with the transmission or sale of electric energy . . . and all rules and regulations" relating to those rates or charges be "just and reasonable."[21] FERC must approve tariffs submitted by public utilities before they can go into effect, and the legal burden of demonstrating that rates set forth in these tariffs are "just and reasonable" is born by the utility.[22] These section 205 filings are either "new document[s] containing or affecting a rate, term or condition" or proposed documents that amend existing "document[s] . . . already on file and in effect."[23] When reviewing these section 205 filings, FERC "is [given] substantial deference in rate-making decisions because "'just and reasonable' is obviously incapable of precise judicial definition,"[24] and rate-related matters "are either fairly technical or involve policy judgments that lie at the core of the regulatory mission."[25]

On the other hand, section 206 empowers FERC to review existing rates or practices to ensure that they are not "unjust, unreasonable, unduly discriminatory or preferential."[26] Either the Commission, of its own accord, or a third-party may initiate a proceeding under section 206.[27] In doing so, the filing must "state the change or changes to be made in the rate, charge, classification, rule, regulation, practice, or contract then in force, and the reasons for the proposed change."[28] Section 206 places the burden of proof on the filing party, which could be the Commission or third-party complainant.[29] If FERC determines existing rates are unjust and unreasonable, FERC must proscribe its own "just and reasonable" rates.[30]

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20. 16 U.S.C. § 824d(a), 824e(a).

21. 16 U.S.C. § 824d(a). Section 205 also makes it unlawful for public utilities to "(1) make or grant any undue preference or advantage to any person or subject any person to any undue prejudice or disadvantage, or (2) maintain any unreasonable difference in rates, charges, service, facilities." 16 U.S.C. § 824d(b).

22. 16 U.S.C. § 824d(e).

23. PJM, FEDERAL LAW GUIDES CHANGES IN PJM GOVERNING DOCUMENTS (2020), https://www.pjm.com/~/media/about-pjm/newsroom/fact-sheets/federal-power-act-sections-205-and-206.ashx#:~:text=Section%20205%20Filings,charge%20to%20FERC%20for%20approval.

24. Delaware Div. of Pub. Advocate v. FERC, 3 F.4th 461, 465 (D.C. Cir. 2021) (quoting Morgan Stanley Cap. Grp. Inc. v. Pub. Util. Dist. No. 1 of Snohomish Cty., 554 U.S. 527, 532 (2008)).

25. *Id.* (quoting S.C. Pub. Serv. Auth. v. FERC, 762 F.3d 41, 55 (D.C. Cir. 2014) (internal citations omitted).

26. 16 U.S.C. § 824e(a).

27. *Id.*

28. *Id.*

29. 16 U.S.C. § 824e(b).

30. 16 U.S.C. § 824e(a).

C. The Prohibition on Market Manipulation Within the Electricity Industry

Market manipulation within the energy market not only "render[s] prices and price-setting mechanism inaccurate and unreliable . . . " but diminishes the overall confidence in the market's ability to produce just and reasonable rates.[31] Market manipulation ultimately causes harm to both market participants and energy consumers through interfering with functioning of free markets and driving up electricity prices to end users.[32] The danger of market manipulation was illustrated by the Western Energy Crisis, which was the event that ultimately motivated Congress to provide FERC with authority to combat market manipulation.[33]

After the events of the Western Energy Crisis, Congress amended the FPA through the EPAct of 2005.[34] Congress passed the amendment to provide the Commission enforcement tools to prohibit market manipulation and authority to enforce civil penalties, the lack of which had previously provided less accountability for utilities and did not "effectively deter and sanction market manipulation."[35]

In turn, the EPAct created section 222 of the FPA, which makes it unlawful for public utilities "to use or employ, in connection with the purchase or sale of electric energy or the purchase of transmission services subject to the jurisdiction of the Commission, any manipulative or deceptive device or contrivance . . . ."[36] FERC exclusively enforces this prohibition on market manipulation.[37] Similar in language, FERC has a regulation codifying FPA section 222, known as the Anti-Manipulation Rule, which was promulgated in Order No. 670.[38]

The Anti-Manipulation Rule prohibits electricity utilities from "engage[ing] in any act, practice, or course of business that operates or would operate as a fraud

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31. FERC, STAFF WHITE PAPER ON ANTI-MARKET MANIPULATION ENFORCEMENT EFFORTS TEN YEARS AFTER EPACT 2005 1 (2016), https://www.ferc.gov/sites/default/files/2020-05/marketmanipulationwhitepaper.pdf [hereinafter STAFF WHITE PAPER].

32. *Id.* at 2. The Western Energy Crisis of 2000 and 2001 resulted from market participants taking advantage of the "underlying supply-demand imbalance and flawed market design." *Final Report on Price Manipulation In Western Markets, Fact-Finding Investigation of Potential Manipulation of Electric And Natural Gas Prices*, FERC Docket No. PA02-2-00 at ES-1 (2003). The market manipulation included, but was not limited to, false reporting of natural gas prices and various forms of prohibited trading strategies. *Id.* The manipulation ultimately led to consumers experiencing high retail electricity prices and rotating blackouts due to power shortages. *Subsequent Events-California's Energy Crisis*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/electricity/policies/legislation/california/subsequentevents.html/.

33. STAFF WHITE PAPER, *supra* note 31, at 2.

34. *See* EPAct of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).

35. STAFF WHITE PAPER, *supra* note 31, at 2.

36. 16 U.S.C. § 824v(a).

37. *Id.*

38. 18 C.F.R. § 1c.2 (2006). FERC's Anti-Manipulation rule prohibits electricity utilities "(1) To use or employ any device, scheme, or artifice to defraud, mak[ing] any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or (3) To engage in any act, practice, or course of business that operates or would operate as a fraud or deceit upon any entity." Order No. 670, *Prohibition of Energy Market Manipulation*, 114 FERC ¶ 61,047 at P 1 (2006).

or deceit upon any [entity]."[39] The Commission defines fraud generally, as "to include any action, transaction or conspiracy for the purpose of impairing, obstructing or defeating a well-functioning market."[40] FERC has applied this Anti-Manipulation Rule in subsequent enforcement actions by holding that entities have the ability to commit fraud even when a tariff or market rule has not been violated.[41]

D. Market-Based Rate Tariffs and FERC's Continuing Oversight

The FPA and FERC precedent allows for public utilities to submit market-based rate tariffs for the sale of electricity in interstate commerce under certain proscribed circumstances.[42] As FERC describes, "[t]he market-based rate tariff governs a seller's wholesale sales at market-based rates."[43] Market-based rate tariffs "state that a seller will enter into freely negotiated contracts with purchasers" rather than setting forth specific prices.[44] Market-based rate tariffs are submitted by public utility wholesale power suppliers and are approved by the Commission when certain conditions are met.[45] In order to secure approval to utilize market-based rates, FERC requires a public utility to show that it lacks or has sufficiently mitigated market power in the market in question, and FERC requires public utilities to abide by the additional market rules set forth by the Regional Transmission Organizations (RTOs) or Independent System Operators (ISOs) tariff.[46] Additionally, FERC must conduct "ongoing oversight of market-based rate authorizations and market conditions" to ensure that the market-based rates resulting from the tariff are just and reasonable.[47]

This ongoing oversight may include the Commission conducting an investigation into a specific public utility to determine whether it has violated a tariff provision, broken market rules, or engaged in market manipulation.[48] Public utilities and ISOs/RTOs must regularly submit reports detailing their transactions to FERC, which in turn reviews those transactions to ensure that markets are functioning properly and producing rates that are just and reasonable.[49] These reports assist FERC in its ongoing oversight, and provide FERC with the ability to "take

39. 17 C.F.R. § 180.1(a)(3)(2011).

40. Order No. 670, *supra* note 38, at P 50.

41. *Houlian Chen Powhatan Energy Fund*, 151 FERC ¶ 61,179 at P 5 (2015) (citing *Competitive Energy Services*, LLC, 144 FERC ¶ 61,163 at P 50 (2013) (internal citations omitted); *Richard Silkman*, 144 FERC ¶ 61,164 at P 50 (2013); *Lincoln Paper and Tissue, LLC*, 144 FERC ¶ 61,162 at P 36 (2013)).

42. Electric rates may also be set under cost-based rate tariffs. *Frequently Asked Questions (FAQs) Market-Based Rates*, FERC, https://www.ferc.gov/power-sales-and-markets/electric-market-based-rates/frequently-asked-questions-faqs-market-based (last updated May 24, 2022).

43. *Market-Based Rate Tariffs*, FERC, https://www.ferc.gov/industries-data/electric/overview/electric-market-based-rates/filing-process-information/market-based-rate-etariff (last updated Aug. 7, 2020).

44. *Morgan Stanley Cap. Grp. Inc*., 554 U.S. at 531.

45. *Market-Based Rates For Wholesale Sales of Electric Energy, Capacity and Ancillary Services by Public Utilities*, 72 Fed. Reg. 39,904, 39,906 (2007).

46. *Id.*

47. *Id.*

48. *Id.*

49. 72 Fed. Reg. 39,904, at 39,906.

steps [in] address[ing] seller market power or modify[ing] rates."[50] Accordingly, FERC has the authority to remedy any violation through ordering refunds to customers or through imposing civil penalties.[51]

FERC's market-based rate powers are based on "longstanding precedent" that the Court identifies in *Public Citizen*.[52] According to these cases, FPA Section 205 does not "dictate[] the precise methodology the Commission must use to ensure the justness and reasonableness of rates."[53] Rather, as the Court notes, the only requirements that the Commission must meet to authorize market-based prices set by auction to satisfy FPA Section 205 are that "(1) sellers participating in regional markets obey the rules designed to ensure fair and competitive markets, and (2) the Commission's continuing and vigilant monitoring of transaction reports verify that the markets work properly when the rubber meets the road."[54] Satisfying these two requirements allows the Commission to assume that the individual market-based prices produced by a particular auction methodology are just and reasonable.[55] Given "the dual requirement of an *ex ante* finding of the absence of market power and sufficient post-approval reporting requirement," this market-based tariff regime has continuously been upheld by the circuit courts.[56]

E. Midcontinent Independent System Operator and its Capacity Auction

In the United States, electricity is predominantly generated at centralized generation facilities.[57] During 2021, about 61% of the resources used to generate electricity utilized fossil fuels, with nuclear energy accounting for around 19% of the resources used, and renewable energy sources accounting for about 20%.[58] From these centralized generation facilities, generated electricity travels through "high-voltage transmission lines" across long distances, often interstate.[59] At substation facilities, the voltage of the electricity is adjusted, where it is then distributed to the end users through power lines.[60] The U.S. electric grid is "compris[ed] [of] 7,700 power plants, 3,300 utilities, and over 2.7 million miles of power lines."[61]

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50. *Id.*

51. *Id.*

52. *Pub. Citizen, Inc.*, 7 F.4th at 1194.

53. *Id*. (citing Elizabethtown Gas Co. v. FERC, 10 F.3d 866, 870 (D.C. Cir. 1993)).

54. *Id.*

55. *Id.* (quoting Montana Consumer Counsel v. FERC, 659 F.3d 910, 919 (9th Cir. 2011)).

56. *Pub. Citizen, Inc.*, 7 F.4th at 1194 (quoting California ex rel. Lockyer v. FERC, 383 F.3d 1006, 1013 (9th Cir. 2004)).

57. *Centralized Generation of Electricity and its Impacts on the Environment*, ENV'T PROT. AGENCY, https://www.epa.gov/energy/centralized-generation-electricity-and-its-impacts-environment (last updated Feb. 23, 2023).

58. *What is U.S. electricity generation by energy source?*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/tools/faqs/faq.php?id=427&t=3 (last updated Mar. 2, 2023).

59. James McBride and Anshu Siripurapu, *How Does the U.S. Power Grid Work?*, COUNCIL ON FOREIGN RELS., https://www.cfr.org/backgrounder/how-does-us-power-grid-work (last updated July 5, 2022).

60. *Id.*

61. *Id.*; Tim Meko, *Six Maps That Show the Anatomy of America's Vast Infrastructure*, WASH. POST. (Dec. 1, 2016), https://www.washingtonpost.com/graphics/national/maps-of-american-infrastrucure/.

RTOs and ISOs collectively manage the electricity system in much of the United States.[62] With the ultimate goal of "foster[ing] competitive neutrality in wholesale electricity markets,"[63] these ISO/RTOs serve functions ranging from managing its regional power grids to providing reliable transmission.[64] For several of these ISOs and RTOs, its management also includes operating capacity auctions, which are aimed at setting market-based rates for electric capacity.[65]

The primary ISO involved in *Public Citizen*, MISO, delivers electric power across fifteen states, primarily in the Midwest and the South.[66] Responsible for "operat[ing] one of the world's largest energy markets," MISO services a total of forty-two million people.[67] MISO runs a capacity market, and does so by conducting an annual "Planning Resource Auction," where market participants can buy and sell capacity for each of the nine regional zones designated within MISO's area.[68] This "Planning Resource Auction" is a market-based auction whose methodology the Commission approved as satisfactory to ensure fair and competitive outcomes within that market.[69] Within MISO's capacity auction, generators offer to sell commitments to provide specified amounts of electricity to utilities in the future at a specific price.[70] The minimum amount of capacity required to meet the anticipated need in each MISO zone is categorized as a "local clearing requirement."[71] Prices are measured in dollars per Megawatts (MW) day.[72]

In conducting its Planning Resource Auctions during the period at issue in *Public Citizen*, MISO maintained FERC-approved auction rules to help mitigate market power and ensure that the market-based rates produced by such auctions were just and reasonable.[73] As discussed in *Public Citizen*, MISO's rules for Planning Resource Auctions in effect during 2015 allowed generators to export their

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62. *Electric Power Markets*, FERC, https://www.ferc.gov/electric-power-markets# (last updated July 20, 2021). Electric energy in the Southeast and much of the West is provided by vertically integrated public utilities, rather than RTOs/ISOs. *Id.*

63. REGUL. ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 17 (2011), https://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-electricityregulationintheus-guide-2011-03.pdf.

64. *Coming together to create a smarter & stronger North American power grid*, ISO/RTO COUNCIL, https://isorto.org/#about-section (last accessed Oct. 3, 2021). *See also* FERC, ENERGY PRIMER: A HANDBOOK FOR ENERGY MARKET BASICS 61 (2020), https://www.ferc.gov/sites/default/files/2020-06/energyprimer-2020_Final.pdf.

65. MISO, 2021/2022 PLANNING RESOURCE AUCTION (PRA) RESULTS 3 (2021) https://cdn.misoenergy.org/PY21-22%20Planning%20Resource%20Auction%20Results541166.pdf.

66. MISO, FACT SHEET, https://cdn.misoenergy.org//Fact%20Sheet%20-%20March%202023627569.pdf.

67. *Id.*

68. POTOMAC ECONOMICS, 2020 STATE OF THE MARKET REPORT FOR THE MISO ELECTRICITY MARKETS at vii-viii (2020), https://www.potomaceconomics.com/wp-content/uploads/2021/05/2020-MISO-SOM_Report_Body_Compiled_Final_rev-6-1-21.pdf.

69. *Midwest Indep. Transmission Sys. Operator, Inc.*, 139 FERC ¶ 61,199 (2012), *order on reh'g*, 153 FERC ¶ 61,229 (2015).

70. Advanced Energy Mgmt. All. v. FERC, 860 F.3d 656, 659 (D.C. Cir. 2017).

71. *Pub. Citizen, Inc*., 168 FERC ¶ 61,042 at P 3 (2019) [hereinafter 2019 Order].

72. *Id.* at P 5.

73. ELECTRICITY REGULATION IN THE US: A GUIDE, *supra* note 63, at 17.

capacity to other ISOs/RTOs, including to PJM Interconnection, LLC (PJM).[74] In order to prevent sales to other ISOs/RTOs from leading to unjust and unreasonable rates, MISO calculated the "initial reference level" based on the "opportunity cost" of selling capacity in its own auction verses selling capacity into the PJM capacity market.[75] In the case of the 2015 Auction at issue in *Public Citizen*, offers were lowered in that auction by using a formula containing the initial reference level and the cost of new entry, which is the cost required for a new generation resource to sell in a particular zone.[76]

As described in *Public Citizen*, FERC ultimately found MISO's auction methodology unworkable following the anomalous outcome of the 2015 Auction, which produced market-based prices that were both unjust and unreasonable, and prospectively changed the initial reference level and local clearing requirement calculations because the tariff methodology was "no longer just and reasonable for prospective application."[77] FERC explained that the change to the initial reference level was necessary because of PJM's transition to the Capacity Performance Construct, which would have required "MISO capacity resources [to] satisfy additional requirements to sell capacity into PJM."[78] PJM's construct change would in turn "make PJM capacity prices non-comparable to MISO capacity prices, and thus make that opportunity a less appropriate basis for MISO's market power mitigation provisions [for future auctions]."[79]

The Commission also concluded that there was "neither sufficient demand in PJM nor sufficient transmission availability into PJM to make [selling electricity capacity into PJM in future auctions] possible."[80] Accordingly, FERC separately found that the local clearing requirement calculation required change because of its consideration for when locally generated capacity is exported to other regions, like PJM, in each MISO zone.[81]

The initial reference level, based on the opportunity cost of selling into PJM, "directly affected the boundaries within which rates were set" and "helped set the upper limit on permissible offers into MISO's auction."[82] Based on "the evidence and data [regarding] demand and transmission availability," the methodology allowed for Dynegy Marketing and Trade, LLC (Dynegy) to take advantage of its place as a pivotal supplier in the 2015 Auction as well.[83] Since "the demand for capacity could not be met without it," Dynegy could "submit [offers] 600% higher" than they would have been had the initial reference level set at $0, the level that FERC proscribed for future auctions, all while still remaining within the

74. 2019 Order, *supra* note 71, at P 34.
75. *Pub. Citizen, Inc.*, 7 F.4th at 1189.
76. *Id.* at 1187.
77. *Id.* at 1189 (quoting *Pub. Citizen, Inc.*, 153 FERC ¶ 61,385 at P 3 (2015)).
78. 153 FERC ¶ 61,385 at P 87.
79. *Id.*
80. *Pub. Citizen, Inc.*, 7 F.4th at 1189.
81. *Id.* at 1190.
82. *Id.* at 1189.
83. *Id.* at 1197.

market-based rate boundaries as a permissible offer under the 2015 MISO tariff.[84] As a result, FERC required MISO to revise its auction methodology to ensure that prices produced through the auction produce just and reasonable market-based results.[85] But while FERC ordered prospective changes to the market rules at issue, it declined to adjust prices produced under those same rules in the 2015 auction and as noted earlier, closed its separate market manipulation investigation without taking further action.[86]

F. Judicial Review of FERC Orders

Under the FPA, after the Commission issues an order, a party may seek review of that order by submitting a request for rehearing.[87] FERC has the power to grant or deny the rehearing request, and after this has occurred, an "aggrieved" party may seek judicial review of that order in the appropriate federal appellate court.[88] The courts are limited in what aspects of administrative orders they may review, as the Administrative Procedure Act (APA) precludes judicial review of agency actions that are "committed to agency discretion by law."[89] Courts have held that an agency's decision not to take enforcement action is unreviewable.[90]

To the extent the Commission's order are reviewable, appellate courts review Commission orders under the "arbitrary and capricious" standard, and have long recognized this scope of review as narrow.[91] The APA requires a reviewing court to invalidate "agency actions, findings, and conclusions [that are] found to be—arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. . . ."[92] Therefore, courts must review FERC decisions under this standard, and have held FERC conclusions as arbitrary and capricious where FERC did not provide an adequate or reasonable explanation for its findings.[93] As such, to survive judicial review, FERC must demonstrate a "rational connection between the facts found and the choice made" and base its decision on the evidence before it.[94] Despite the narrow scope of review, courts have consistently held agency decisions as arbitrary and capricious where the agency has "failed to consider an important aspect of the problem."[95]

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84. *Pub. Citizen, Inc.*, 7 F.4th at 1190, 1197.

85. 153 FERC ¶ 61,385.

86. *Pub. Citizen, Inc.*, 7 F.4th at 1082.

87. 16 U.S.C. § 825*l* (1995).

88. *Id.*

89. 5 U.S.C. § 701(a)(2).

90. *Chaney*, 470 U.S. at 831.

91. Motor Vehicle Mfgrs. Ass'n v. State Farm Mutl. Auto. Ins. Co., 463 U.S. 29, 43 (1983).

92. 5 U.S.C. § 706 (2011).

93. *Delaware Div. of Pub. Advocate*, 3 F.4th at 469; Pac. Gas & Elec. Co. v. FERC, 306 F.3d 1112 (D.C. Cir. 2002).

94. *Motor Vehicle Mfgrs. Ass'n*, 463 U.S. at 43 (quoting Burlington Truck Lines v. United States, 371 U.S. 156, 168 (1962)).

95. *Id.*

G. Procedural History of FERC Orders Relevant to Public Citizen

In the 2015 MISO Planning Resource Auction, the auction clearing price was $150 per MW-day for Zone 4.[96] The clearing prices of neighboring zones were established at $3.50 per MW-day in the 2015 Auction, and the capacity price for Zone 4 during the previous 2014 MISO Planning Resource Auction was $16.75.[97] In comparison, this price was not only over forty times higher than neighboring zones, but nine times greater than the prior year's prices for Zone 4.[98]

As a result of this anomalous auction result, Public Citizen and several other complainants filed a FPA Section 206 complaint with FERC, alleging that the auction resulted in unjust and unreasonable rates for Zone 4.[99] In doing so, Public Citizen alleged that these unjust and unreasonable rates were a result of Dynegy exercising market power, and Dynegy's "illegal market manipulation of the auction through withholding competitive offers."[100] Complainants alleged that the MISO tariff's "initial reference level" within the auction rules did not accurately estimate the opportunity cost of selling generated electricity outside of MISO and into the PJM RTO.[101]

However, most crucially for the analysis conducted here, complainants "separately argued that, notwithstanding any filed market-based tariffs, all auction results 'must be reviewed after the fact to determine whether they actually produce just and reasonable rates.'"[102] This was a direct challenge to FERC's practice of deeming all market-based prices produced as part of a Commission-approved auction methodology as just and reasonable.

While the Complainants challenged both the outcome of the 2015 MISO Capacity Auction and the auction's methodology, FERC addressed only part of these complaints in a December 2015 Order, focusing exclusively on the auction's methodology and not addressing the outcome of the 2015 MISO auction.[103] In this December 2015 Order, FERC prospectively changed the initial reference level and local clearing requirement tariff calculations because of the changes to the PJM capacity market, the lack of sufficient demand in PJM, and PJM's lack of sufficient transmission ability, which would have affected the functionality of future auctions.[104]

In addition to the MISO tariff calculation changes, FERC announced that it would be conducting a market manipulation investigation into the 2015 MISO auction.[105] FERC then conducted its market manipulation investigation, waiting

96. *Pub. Citizen, Inc.*, 7 F.4th at 1182.

97. *Id.*

98. *Id.* This would allegedly lead to total capacity charges increasing by $102.1 million for consumers in 2015. *Id.* at 1188

99. *Id.* at 1188.

100. *Pub. Citizen, Inc.*, 7 F.4th at 1188.

101. *Id.* at 1188-89.

102. *Id.* at 1188.

103. 153 FERC ¶ 61,385 at P 3.

104. *Pub. Citizen, Inc.*, 7 F.4th at 1189.

105. 153 FERC ¶ 61,385 at P 4.

approximately three years before releasing another order on the pending complaints in 2019.[106]

In the 2019 Order, FERC denied the other complaints and found that the auction results for Zone 4 were just and reasonable.[107] FERC advised that it had closed the market manipulation investigation against Dynegy because it had not found any violation of FERC's anti-manipulation regulations.[108] FERC's sole explanation for finding that Dynegy had not exercised market power to cause the unjust and unreasonable auction clearing price was that the auction resulted from MISO's application of the previously accepted, just and reasonable MISO tariff.[109] The methodology that the Commission stated was just and reasonable in the 2019 Order was the same methodology that the Commission found to be prospectively unjust and unreasonable in its December 2015 Order.[110]

FERC rejected Public Citizen's argument that each individual auction price must be reviewed before taking effect, explaining that no affirmative finding of justness and reasonableness was required on its end "before allowing the rate to go into effect."[111] According to FERC, "the rate on file with the Commission is the Tariff describing the Auction procedures, not the prices that may change over time."[112] As the Commission reasoned, since the auction methodology had been deemed just and reasonable, all prices produced through that auction were considered just and reasonable without the requirement of evaluating the lawfulness of individual rates.[113]

In 2020, Public Citizen sought rehearing, and argued that FERC had failed to determine whether Dynegy had manipulated the market, while pointing out that FERC relied only on a tariff that the Commission earlier found to be defective to support its decision that the rates were just and reasonable.[114] In turn, FERC concluded that Public Citizen had not properly defined market manipulation and failed to meet its burden of showing that the rates were unjust and unreasonable.[115]

III. ANALYSIS

Public Citizen sought review of the 2019 Order and 2020 Rehearing Order in the D.C. Circuit, raising three challenges.[116] Public Citizen's petition for review argued that the Commission's orders were deficient because (1) "the Commission failed to meet its obligation to ensure just and reasonable rates because it did not review the prices resulting from the 2015 Auction before those prices went into

106. *Pub. Citizen, Inc.*, 7 F.4th at 1190.
107. 2019 Order, *supra* note 71, at P 2.
108. *Id.* at P 32.
109. *Id.* at P 84.
110. 2019 Order, *supra* note 71; 153 FERC ¶ 61,385.
111. *Pub. Citizen, Inc*., 7 F.4th at 1190.
112. *Id.*
113. *Id.*
114. *Id.* (citing *Pub. Citizen, Inc.*, 170 FERC ¶ 61,227 at P 6 (2020) [hereinafter Rehearing Order]).
115. 170 FERC ¶ 61,227 at P 14.
116. *Pub. Citizen, Inc*., 7 F.4th at 1192-93.

effect;" (2) "the Commission was arbitrary and capricious in failing to adequate explain its decision to close its investigation into whether Dynegy engaged in market manipulation;" and (3) "the Commission failed to adequately explain its conclusion that the results of the 2015 Auction were just and reasonable."[117]

In the unanimous decision, the Court determined that it could not review FERC's decision to close the market manipulation investigation into Dynegy, nor could it review FERC's short explanation for making this decision because those enforcement decisions were "committed to agency discretion by law."[118] The Court also held that FERC's decision to leave the 2015 auction results undisturbed was arbitrary and capricious because it failed to explain how the same market rules if found unreasonable (and ordered changed prospectively) could nonetheless produce just and reasonable auction results.[119] But while it remanded *that* decision, the Court rejected Public Citizen's challenge that FERC had failed to review "each individual market-based price" *before* they went into effect, holding that this was not a requirement for market-based rates under section 205 of the FPA.[120]

A. Closing A Market Manipulation Investigation Is an Unreviewable Decision Committed to FERC's Administrative Discretion

One of Public Citizen's challenges was that FERC's decision was arbitrary and capricious for the failure to provide an adequate explanation for closing its market manipulation investigation into Dynegy.[121] Holding that it could not review FERC's enforcement decision, the Court looked to the long-held principle that an agency's decision not to take enforcement action or pursue further investigation is discretionary and presumptively precluded from judicial review.[122]

In doing so, it applied *Heckler v. Chaney*, a case that holding that agency enforcement decisions are examples of agency actions "committed to agency discretion by law" and hence unreviewable.[123] In addition to the Supreme Court's *Chaney* opinion, the Court pointed to its own precedent in *Baltimore Gas & Elec. Co. v. FERC*, which specifically addressed FERC's nonreviewable enforcement discretion.[124] According to *Baltimore*, FERC's decision to close an investigation

117. *Id.*

118. *Id.* at 1195.

119. *Id.* at 1200.

120. *Pub. Citizen, Inc.*, 7 F.4th at 1193.

121. *Id.* at 1195.

122. *Id.* at 1196 (citing *Chaney*, 470 U.S. at 831; 5 U.S.C. § 701(a)(2)).

123. *Id.* at 1195-96. As cited by the Court, Chaney outlined the various discretionary determinations that an agency must make before deciding to bring an enforcement action, including whether "agency resources are best spent on this violation or another, whether the agency is likely to succeed if it acts, whether the particular enforcement action requested best fits the agency's overall policies, and, indeed, whether the agency has enough resources to undertake the action at all. *Id. See Chaney*, 470 U.S. at 821; 5 U.S.C. § 701(a)(2).

124. *Pub. Citizen, Inc.*, 7 F.4th at 1195-96 (citing Baltimore Gas & Elec. Co. v. FERC, 252 F.3d 456, 460 (D.C. Cir. 2001).

is "a paradigmatic instance of an agency exercising its presumptively nonreviewable enforcement discretion."[125]

Based on these precedents, the Court concluded that FERC's decision to close the market manipulation investigation fit within FERC's nonreviewable enforcement discretion, and therefore it could also not review FERC's explanation for doing so.[126] In the Court's view, the explanation FERC provided "was made for the sole purpose of explaining the Commission's decision not to pursue an enforcement action."[127] Overall, the D.C. Circuit applied precedent regarding the non-reviewability of agency enforcement decisions and interpreted those precedents and the FPA as giving FERC broad discretion in dealing with market manipulation investigations and determining whether those investigations should continue.

B. FERC Must Provide an Explanation for Its Finding That the 2015 MISO Auction Resulted in Just and Reasonable Rates

In the evaluation of another argument brought by Public Citizen, the Court held that FERC failed to provide an explanation for how MISO Zone 4's 2015 auction results could logically be just and reasonable in light of the prospective changes to the MISO tariff FERC required in its December 2015 Order.[128] More specifically, it faulted FERC for failing to explain how the 2015 Order, which found that the auction provisions in the MISO's tariff as constituted and applied in the 2015 MISO Auction could no longer "protect against anticompetitive behavior" in future auctions, nonetheless resulted in just and reasonable rates in that same 2015 Auction.[129] Nor, the Court concluded, did FERC explain how "market manipulation did not lead to unjust and unreasonable rates" as it pertained to the 2015 MISO Auction.[130] Accordingly, the Court held that FERC's decision was arbitrary and capricious and remanded the orders to FERC to provide an explanation.[131]

In reaching its conclusion, the Court rejected FERC's explanation that the 2015 MISO Auction results were just and reasonable because Dynegy's auction offers were permissible under the MISO tariff then in effect.[132] As the court pointed out, FERC had already found in its December 2015 Order that the tariff provisions were no longer producing reasonable prices, a conclusion it failed to reconcile with FERC's 2019 order to allow the auction results as just and reasonable.[133] The problems the Commission identified with the MISO tariff provisions

125. *Pub. Citizen, Inc*., 7 F.4th at 1195 (citing 252 F.3d at 460).
126. *Pub. Citizen, Inc.*, 7 F.4th at 1195.
127. *Id.*
128. *Id.* at 1196.
129. *Id.*
130. *Pub. Citizen, Inc.*, 7 F.4th at 1196.
131. *Id.* at 1200.
132. *Id.* at 1197.
133. *Id.* at 1198-99.

governing the Planning Resource Auction logically not only affected future auctions, but the 2015 auction.[134] The Court reasoned that these issues directly impacted how rates were set and thus also created the price anomaly seen in the 2015 Auction.[135] Earlier in the opinion, the Court observed that the auction provisions allowed for Dynegy to offer and receive any price it desired while still remaining in the boundaries of a permissible offer under the tariff.[136] This is because the opportunity cost calculation of selling to PJM was inapplicable to the market, and based on this inapplicability, sellers – including Dynegy – could essentially "exercise[] . . . market power or market manipulation" without accountability.[137]

The Court then examined FERC's response to the market manipulation allegation in its 2020 Rehearing Order.[138] According to the D.C. Circuit, FERC could not rely on what the Commission determined to be a failure to define market manipulation, as Public Citizen had "straightforwardly asserted" its allegation that Dynegy had manipulated the market through economic withholding and caused the unjust and unreasonable rates.[139] The Court determined that FERC's bare statement that higher clearing prices do not necessarily mean market manipulation has occurred in a market was insufficient to address the potential market manipulation alleged.[140] In light of the significant evidence brought by Public Citizen, the Court also held that FERC failed to provide a rational explanation for how the MISO 2015 Auction prices in Zone 4 were just and reasonable when they were implemented under a tariff methodology that FERC itself recognized was seriously flawed and could "no longer produce just and reasonable results."[141]

C. FERC Is Not Required to Review Individual Market-Based Electricity Prices Before They Go into Effect Under FPA Section 205

Public Citizen also sought the Court to require FERC to review each price produced by a pre-approved market-based rate auction methodology to determine that the individual prices were just and reasonable before they went into effect.[142] Ultimately, the Court rejected Public Citizen's argument, finding that the Commission's market-based rate methodology was lawful and produced just and reasonable rates, and that FERC was not required to evaluate each individual rate produced by the rate auction to determine whether those individual rates were just and reasonable before they could go into effect.[143]

In its analysis rejecting Public Citizen's argument, the Court first observed that the market-based rate procedures FERC uses to ensure just and reasonable

134. *Pub. Citizen, Inc.*, 7 F.4th at 1197.
135. *Id.* at 1198.
136. *Id.* at 1188.
137. *Id.* at 1200.
138. *Pub. Citizen, Inc.*, 7 F.4th at 1198.
139. *Pub. Citizen, Inc.*, 7 F.4th at 1199.
140. *Id.* at 1200.
141. *Id.*
142. *Id.*
143. *Pub. Citizen, Inc.*, 7 F.4th at 1193.

rates has been found to satisfy FPA section 205 in previous cases.[144] In support of that conclusion, the Court primarily cited to four cases – *Elizabethtown*,[145] *Lockyer*,[146] *Montana Consumer Counsel*,[147] and *Blumenthal*.[148] Each of these cases informed the Court's analysis.

The Court relied on *Elizabethtown* for its reasoning that "[t]he use of market-based tariffs was first approved in the natural gas context," and "conditioned on the existence of a competitive market."[149] In *Elizabethtown*, the Court held that FERC's reliance on the market-based rate bidding system "in lieu of cost-of-service regulation" was permissible and found that FPA section 205 does not "dictate[] the precise methodology the Commission must use to ensure the justness and reasonableness of rates."[150] In adopting *Elizabethtown*, the D.C. Circuit expanded upon the prior court's reasoning by giving examples of some allowable review methods including "individualized review or [the] review[] and monitoring [of] the process by which rates are computed."[151] The Court embraced *Elizabethtown's* holding that FERC has broad discretion to structure methodologies to ensure just and reasonable rates.[152]

The Court then relied on *Lockyer* in concluding that a proven competitive market should be presumed to produce just and reasonable rates, assuming the agency monitors the functioning of that market to ensure it remains competitive.[153] In *Lockyer*, California challenged market-based tariffs, relying on Supreme Court precedent which disapproved of other agencies' regulatory schemes that "relied on market forces alone in approving market-based tariffs."[154] *Lockyer* distinguished those schemes however, noting the "dual requirement of an ex ante finding of the absence of market power and sufficient post-approval reporting requirements" meant that it was safe to assume that rates produced by such a system were just and reasonable.[155] As the Court explained,"[i]n a 'competitive market, where neither buyer nor seller has significant market power, it is rational to assume that the terms of their voluntary exchange are reasonable, and specifically to infer that price is close to marginal cost, such that the seller makes only a normal return on its investment.'"[156]

Relying on this case, the Court in *Public Citizen* then held that the FPA's use of the term "rates and charges" found within section 205, does not justify requiring

144. *Id.*

145. *Elizabethtown Gas Co.*, 10 F.3d 866.

146. *Lockyer*, 383 F.3d 1006.

147. *Montana Consumer Couns.*, 659 F.3d 910.

148. Blumenthal v. FERC, 552 F.3d 875, 882 (D.C. Cir. 2009).

149. *Lockyer*, 383 F.3d at 1012 (citing *Elizabethtown Gas Co.*, 10 F.3d at 870).

150. *Pub. Citizen, Inc.*, 7 F.4th at 1194 (citing *Elizabethtown Gas Co.*, 10 F.3d at 870).

151. *Id.*

152. *Id.*

153. *Id.* at 1194 (citing *Lockyer*, 383 F.3d at 1013-14).

154. *Lockyer*, 383 F.3d at 1013.

155. *Id.*

156. *Elizabethtown Gas Co.*, 10 F.3d at 870 (quoting Tejas Power Corp. v. FERC, 908 F.2d 998, 1004 (D.C. Cir. 1990)).

an additional review to determine whether prices determined under a properly constituted market-based rate regime produce just and reasonable rates.[157] As the Court stated, "[t]he whole premise of the Commission's market-based system is that a properly competitive market will necessarily produce just and reasonable prices."[158] The *Lockyer* decision thus follows from *Elizabethtown* by approving of FERC's exercise of its broad ratemaking discretion to craft a market-based system relying on the participation in competitive markets to presumably produce just and reasonable rates.[159]

The Court goes on to cite its prior decision in *Blumenthal* where it previously found that "the Commission requires assurance from any market-based rate tariff that the seller cannot exercise anticompetitive market power."[160] The Court then details all the measures that FERC took in this instance to ensure that sellers could not exercise market power and therefore the market was reasonably competitive.[161] These measures include (1) a determination that sellers lack market power; (2) that sellers have abided by the tariff rules of the RTO administering the auction; and (3) that the Commission conducts continual oversight of market participants and outcomes to ensure that the market remains competitive.[162] The Court found that the Commission met all of these criteria in the case of the electric capacity auction in *Public Citizen*.[163]

The Court emphasized that continuing oversight by FERC is necessary to ensure that competitive markets are functioning as intended and thus are continuing to produce just and reasonable rates.[164] In examining FERC's oversight of the market-based rate auction in *Public Citizen*, the Court found that FERC's oversight of established competitive markets was sufficient to meet that requirement.[165] This led the Court to then reject Public Citizen's argument that FPA section 205 requires FERC to examine "each individual [resulting] market-based price [for justness and reasonableness] . . . before they go into effect."[166]

To support this aspect of its decision, the Court relied upon *Montana Consumer Counsel* which found that sufficient oversight of competitive markets does not require FERC to determine whether individual prices set by the market are just and reasonable, but rather FERC only must review prices "to ensure that [they] are consistent with the data expected of a competitive, unmanipulated market."[167] The Court found that the Commission met this requirement here.[168] FERC required sellers to file quarterly sales reports and periodic market power analyses, while

157. *Pub. Citizen, Inc.*, 7 F.4th at 1194 (quoting 16 U.S.C. § 824d(a), (c), (d), (e)).
158. *Id.*
159. *Lockyer*, 383 F.3d at 1012.
160. *Pub. Citizen, Inc.*, 7 F.4th at 1185 (citing *Blumenthal*, 552 F.3d at 882).
161. *Id.* at 1185-86.
162. *Pub. Citizen, Inc.*, 7 F.4th at 1193.
163. *Id.* at 1182.
164. *Id.* at 1193.
165. *Id.* at 1193-94.
166. *Pub. Citizen, Inc.*, 7 F.4th at 1193.
167. *Id.* (quoting *Montana Consumer Couns.*, 659 F.3d at 919).
168. *Id.* at 1194.

RTOs/ISOs were required to submit market data on an ongoing basis.[169] These reporting requirements, combined with the Commission's active review of those reports and willingness to revoke market-based rate authority where necessary, were enough to convince the Court that FERC met its obligations under *Blumenthal* and *Montana Consumer Counsel*.[170]

In summary, the Court held that the individual prices, while important to FERC's supervisory process, do not need to be found just and reasonable because the market-based system itself should presumably result in "just and reasonable" rates.[171] According to the Court, rates can be considering just and reasonable because FERC must find that public utilities lack or have sufficiently mitigated market power before granting market-based rate authority and approving a market-based rate tariff, and FERC conducts "ongoing oversight of market-based rate authorizations and market conditions" to ensure that markets remain competitive.[172] Therefore, the Court ultimately held that, if market power is sufficiently mitigated, tariff rules are followed, and FERC continues its oversight, the reliance on the market-based system to set just and reasonable rates satisfies FERC's obligations under FPA section 205.[173]

D. The Court Was Justified in Finding that the Commission Did Not Need to Determine that Individual Auction Prices Were Just and Reasonable

As noted above, the Court found *Lockyer*, *Elizabethtown,* and other D.C. Circuit precedent to be convincing when it found that FERC need not review each individual price produced in the market to be just and reasonable before taking effect. In doing so, the Court relied on the premise that the market-based system, in theory, will already produce just and reasonable rates in a competitive market and laying out the thoroughness of FERC's current supervisory system to support the finding that the additional review is unnecessary.[174] The Court's decision to rely on these cases to make this determination was reasonable because Congress gave FERC a great deal of discretion in crafting methodologies to ensure that rates are just and reasonable, and the methodology that FERC did adopt was rationally relied on both market-based rate economics and included backstops in the form of reporting requirements to protect against uncompetitive outcomes.

As the Court reasoned, FERC created a market-based auction system that first ensured that none of the market participants could exercise market power and then set forth procedures to ensure that the auction system remained competitive over time.[175] Since the Commission has determined that none of the market participants has market power, the economics of market-based rates dictates that any prices

169. *Id.* at 1185-86.

170. *Pub. Citizen, Inc.*, 7 F.4th at 1194.

171. *Montana Consumer Couns.*, 659 F.3d at 919; *see Market-Based Rates*, 72 Fed. Reg. 39,904, at 39,906, 39,919.

172. *Pub. Citizen, Inc.*, 7 F.4th at 1194; 72 Fed. Reg. 39,904, at 39,906.

173. *Pub. Citizen, Inc.*, 7 F.4th at 1194.

174. *Id.* at 1194-95.

175. *Id.* at 1194.

produced as part of this competitive market would be set free of the influence of any sellers' market power, no one seller could exercise market power to imposed supra-competitive prices, and therefore prices produced through that market would presumably be just and reasonable.

The Commission then actively monitors markets with market-based rate authority to ensure that sellers do not amass market power and thus drive up prices to supra-competitive levels.[176] Instead of "pil[ing] on another layer of agency review" the Court reasoned that FERC's system sufficiently adheres to the requirements of the FPA by ensuring that a competitive market exists and remains competitive in producing market-based prices for electricity.[177] In doing so, the Court correctly found that whether specific auction prices are just and reasonable is not the main inquiry to whether electric prices are just and reasonable under the FPA, but rather whether the system that produced those prices was and remains reasonably competitive.[178] As the Court explains, "[t]he 'rate' filed by authorized power wholesalers is the 'market rate,' and that rate does not 'change' even though the prices charged by the wholesalers may rise and fall with the market."[179]

The Supreme Court has never directly weighed in on whether the market-based regime is permissible under the FPA, specifically reserving this judgment in 2011.[180] However, if the issue of whether individual prices produced pursuant to a market-based electricity auction must be individually assessed to determine whether they are just and reasonable were raised before the Court, one could expect the Court to uphold the reasoning like that set forth in *Public Citizen* because the D.C. Circuit's findings were well founded. In addition to being based on longstanding precedent, the *Public Citizen* Court acknowledged FERC's discretion to craft a reasonable system to ensure just and reasonable rates and evaluated FERC's methodology for granting market-based rates, as well as its ongoing review and supervisory measures concerning the functioning of competitive markets.

While FERC could review each individual resulting price if it chose*, Public Citizen* clarifies that it does not violate the FPA for FERC to decline to evaluate individual rates and instead construct a market-based system that relies on the outcomes of demonstrably competitive markets to produce just and reasonable rates. As the Court correctly noted, the FPA does not require a "precise methodology [for] the Commission . . . to [use] to ensure the justness and reasonableness of rates."[181] Additionally, FERC's supervision of ongoing, functioning competitive markets does include reviewing prices, but the prices are reviewed "to ensure that the reported transactions are consistent with the data expected of a competitive, unmanipulated market," rather than to evaluate the justness and reasonableness of the prices.[182]

176. *Id.* at 1193-94.

177. *Pub. Citizen, Inc.*, 7 F.4th at 1194.

178. *Id.* at 1185.

179. *Id.* at 1194 (quoting *Montana Consumer Couns.*, 659 F.3d at 921).

180. *Morgan Stanley Cap. Grp. Inc.*, 554 U.S. at 527.

181. *Pub. Citizen, Inc.*, 7 F.4th at 1194 (citing *Elizabethtown*, 10 F.3d at 870).

182. *Id.* at 1186 (quoting *Montana Consumer Couns.*, 659 F.3d at 919).

Therefore, it was reasonable for the Court in *Public Citizen* to hold that FERC has discretion to craft a market-based auction methodology that presumably produces just and reasonable rates rather than evaluate every rate individually. The Court relied on several cases that interpret the FPA to give FERC broad discretion to determine how to supervise electric rates, which includes relying on the competitive market-based system to produce just and reasonable rates, an assumption continually confirmed by FERC's ongoing monitoring of markets where the Commission has granted market-based rates.[183] Market-based tariff rules were "designed to ensure fair and competitive markets,"[184] so it follows that FERC need not review each individual prices for justness and reasonableness before taking effect, as in design, those resulting prices should be just and reasonable where there is competition and a lack of market manipulation -- market manipulation that FERC looks for in the required transaction reports that wholesalers must submit.

IV. CONCLUSION

Despite the complex set of facts and procedural history, the D.C. Circuit's holdings in *Public Citizen* seem to clarify FERC's decision-making authority and obligations as they relate to just and reasonable rates.[185] With its holding that FERC is not required to give its affirmative approval to each individual market-based price for justness and reasonableness before taking effect, the Court made clear that FERC's market-based rate powers remain valid under the FPA.[186] The Supreme Court has yet to approve of the Commission's approach, yet *Public Citizen* would likely be upheld because of its extensive reasoning supporting why "when the rubber meets the road," FERC has an effective process in place.[187] As the *Public Citizen* Court noted, FERC has an effective process in place to ensure that markets are and remain competitive and produce market-based rates that are presumed to be just and reasonable.[188] *Public Citizen* provides future electricity wholesalers, consumers, and FERC with a clarification on the electricity market-based system, and it is likely that future courts will adopt *Public Citizen's* reasoning if the system is challenged.

Sotheby Shedeck[*]

183. *See generally Pub. Citizen, Inc.*, 7 F.4th 1177.

184. *Id.* at 1194.

185. 5 U.S.C. § 706; 16 U.S.C. § 824d(a), 824e(a).

186. *See generally Pub. Citizen, Inc.*, 7 F.4th 1177.

187. *Id.* at 1194.

188. *See generally Pub. Citizen, Inc.*, 7 F.4th 1177.

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STANDING ROCK SIOUX TRIBE: WHY WINNING VACATUR UNDER NEPA MAY NOT BE ENOUGH TO LIMIT DAMAGE TO THE ENVIRONMENT

I. INTRODUCTION

Beginning in April 2016, thousands of native and non-native people from across the world gathered at what is now known as the Oceti Sakowin Camp in North Dakota to protest the construction of the Dakota Access Pipeline (DAPL), which could contaminate the water supply for the Standing Rock Sioux Tribe as well as millions of Americans downstream.[1] The protest brought together over

1. Kolby KickingWoman, *Dakota Access Pipeline: Timeline*, INDIAN COUNTRY TODAY, https://indiancountrytoday.com/news/dakota-access-pipeline-timeline.

200 tribes that had not convened for more than 150 years.[2] They were met with police militarization and intimidation, with over 300 injuries at the hands of police in just one instance.[3] What followed was years of court proceedings.[4]

On January 26, 2021, the U.S. Court of Appeals for the D.C. Circuit in *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers* affirmed in part and reversed in part the United States District Court for the District of Columbia.[5] The U.S. Court of Appeals for the D.C. Circuit agreed with the lower court's rulings that the U.S. Army Corps of Engineers (the Corps) must prepare an Environmental Impact Statement, and that the easement granted to Dakota Access must be vacated.[6] However, the Court of Appeals noted that the lower court's order for the emptying of the pipeline was improper.[7] This reversal rested on the application of a four-factor test by the court.[8]

The test applied by the court requires that a plaintiff seeking a permanent injunction demonstrate that it has suffered an irreparable injury, remedies at law are inadequate to compensate for that injury, a remedy in equity is warranted after balancing the parties' hardships, and that the public interest would not be disserved by a permanent injunction.[9] The court analyzed the irreparable injury prong and determined that the Standing Rock Sioux Tribe failed to show such an injury, therefore reversing the lower court's decision ordering the Corps and Dakota Access to empty the pipeline of oil.[10]

The D.C. Circuit's opinion is a case of first impression in that the court has never before had to decide whether to vacate an easement in a case where construction had already been completed.[11] It can also be read to reinforce the perception that the case marks a continuation of the federal government's historic lack of concern for tribal equitable interests.[12]

As the D.C. Circuit's opinion is related to issues of agency consultation with tribes and environmental justice, this note provides a history of the Standing Rock Sioux Tribe and the area the pipeline affects; a brief history of the Dakota Access Pipeline and pipelines in general; relevant permits and permissions; treaties and acts specific to tribal concerns; and a brief overview of tribal consultation. This

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2. *Stand with Standing Rock: Protect Protesters' Rights*, ACLU, https://www.aclu.org/issues/free-speech/rights-protesters/stand-standing-rock.

3. *Id.* Protesters were subject to water cannons in subfreezing weather, as well as concussion grenades, sound cannons, and automatic rifles. *Id.* The National Guard was deployed to assist Dakota Access' private security guards in dealing with the protesters. Rebecca Hersher, *Key Moments in the Dakota Access Pipeline Fight*, NPR (Feb. 22, 2017, 4:28 P.M.), https://www.npr.org/sections/ thetwo-way/2017/02/22/514988040/key-moments-in-the-dakota-access-pipeline-fight.

4. *See* KickingWoman, *supra* note 1.

5. Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers, 985 F.3d 1032 (D.C. Cir. 2021).

6. *Id.* at 1054.

7. *Id.*

8. *Id.* at 1053-54.

9. Monsanto Co. v. Geertson Seed Farms, 561 U.S. 139, 156-57 (2010).

10. *Standing Rock Sioux Tribe*, 985 F.3d at 1053-54.

11. *Id.* at 1054.

12. For more information on the history of federal Indian law in the United States, *see generally* STEPHEN PEVAR, THE RIGHTS OF INDIANS AND TRIBES (Oxford Univ. Press, 4th ed. 2012).

note further provides a brief discussion of the District Court proceedings; a detailed discussion of the appellate court's reasoning; reasons why NEPA is ineffectual in protecting the interests of tribes; an argument for stronger federal tribal consultation; and the future implications that this case will have for environmental justice.

II. BACKGROUND

A. History of Lake Oahe and the Standing Rock Sioux Tribe

Lake Oahe is the fourth largest manmade water reservoir in North America, stretching from Pierre, South Dakota to Bismarck, North Dakota.[13] Its waters provide irrigation, conservation, flood control, electric power, and recreation to many Midwestern States.[14] The lake is also known for the fishing of walleye and other species as well as for the hunting of several species of waterfowl.[15] It is situated along the Missouri River, which forms the fourth largest river system in the world,[16] and runs along the Standing Rock Sioux and Cheyenne River Sioux Indian reservations.[17] The lake's waters service homes, healthcare and educational facilities, businesses, and government buildings and support agriculture and industry on the Standing Rock Sioux Reservation.[18] It is also the primary water source for the Cheyenne River Reservation, and both tribes consider the waters to be sacred and central to their religious practices.[19]

The lake was created by the Corps after the Flood Control Act authorized construction of a dam in 1944.[20] As part of the Pick-Sloan Plan, a joint water development program between the Corps and the Bureau of Reclamation to facilitate the dam's creation, the Corps removed 190 Indian families from their homes on the Standing Rock Sioux Reservation.[21] "Nearly one hundred sixty thousand acres of Indian land" on both the Standing Rock and Cheyenne River reservations was flooded to accommodate the project, and a large hydroelectric power plant

13. *Lake Oahe, South Dakota*, NASA EARTH OBSERVATORY, https://earthobservatory.nasa.gov/images/145962/lake-oahe-south-dakota#:~:text=Lake%20Oahe%20is%20the%20fourth,changes%20frequently%2C%20especially%20during%20droughts.

14. *Id.*

15. *Oahe Hunting and Fishing Details*, U.S. ARMY CORPS OF ENG'RS, https://www.nwo.usace.army.mil/Missions/Dam-and-Lake-Projects/Missouri-River-Dams/Oahe/Hunting-Fishing-Details/.

16. *Missouri River*, AM. RIVERS, https://www.americanrivers.org/river/missouri-river/#:~:text=The%20Missouri%20River%20will%20travel,to%20the%20Gulf%20of%20Mexico.

17. CHEYENNE RIVER SIOUX TRIBE, https://www.cheyenneriversiouxtribe.org/; *The Founding of Standing Rock Sioux Tribe*, STANDING ROCK SIOUX TRIBE, https://standingrock.org/about/.

18. Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers, 255 F. Supp. 3d 101, 114 (D.D.C. 2017).

19. *Id.*

20. U.S. BUREAU OF RECLAMATION, OAHE UNIT: JAMES DIVISION 8-9 (2008), https://www.usbr.gov/history/ProjectHistories/PSMBP%20OAHE%20UNIT.pdf.

21. Michael L. Lawson, *The Oahe Dam and the Standing Rock Sioux*, 6 S.D. HIST. 203, 203-4 (1976).

was installed.[22] The construction of the dam was one in a long series of land cessions that reduced the reservation area from its original 2.3 million acres in 1889 to 844,000 acres by 1976.[23]

B. A General History of U.S. Pipelines and DAPL

The first successful crude oil pipeline was erected in 1865 and transported approximately 2,000 barrels of oil a day across five miles.[24] Such pipelines were intended to allow private companies to control the transport of oil.[25] In the late 1800s, Standard Oil, an oil refining company formed by John D. Rockefeller, controlled ninety percent of oil refining nationwide.[26] Subsequently, Congress enacted the Sherman Antitrust Act in 1890, which challenged the company's monopoly, and the Hepburn Act in 1906, which "required oil pipeline carriers to provide equal service costs to all shippers."[27] Standard Oil was later dissolved by court order in 1912.[28]

As the nation entered WWII, oil became critical to the war effort.[29] In response, the federal government built what was known as the Big Inch, a pipeline that stretched from Texas to New Jersey and was later converted to a natural gas pipeline.[30] In the decades following, companies built more pipeline than any time before or since, a process that went largely unnoticed and undocumented.[31] This increase in pipeline construction was due to growth of industry that took place during the war and increasing awareness of the importance of petroleum to the nation's security interests following wartime gasoline rationing.[32] As of 2014, the U.S. had 2.6 million miles of pipeline running throughout the country, "more than anywhere else in the world,"[33] and as of 2019, the world's longest crude oil pipeline ran 2,353 miles, transporting over 1.6 million barrels a day.[34]

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22. *Id.* at 204-5.

23. *Id.* at 205.

24. Laura Clark, *Oil Companies First Built Pipelines in the 1860s: They've Been Contested Ever Since*, SMITHSONIAN MAG. (Jan. 12, 2015), https://www.smithsonianmag.com/smart-news/americas-first-oil-pipelines-180953870/.

25. *Id.*

26. *Standard Oil Established*, LIBR. OF CONG., https://guides.loc.gov/this-month-in-business-history/january/standard-oil-established.

27. Claudia Farrell, *Digging Further Into the History of Pipelines*, BURNS MCDONNELL (Aug. 14, 2020), https://blog.burnsmcd.com/digging-further-into-the-history-of-pipelines.

28. *Id.*

29. Stephanie Joyce, *The Strange History of the American Pipeline*, KUNC NEWS, (Aug. 5, 2014), https://www.kunc.org/business/2014-08-05/the-strange-history-of-the-american-pipeline.

30. *Id.*

31. *Id.*

32. *Foreign Economic Policy*, *Report to the National Security Council by the Executive Secretary*, OFF. OF THE HISTORIAN (1977), available at https://history.state.gov/historicaldocuments/frus1950v01/d156.

33. Joyce, *supra* note 29.

34. Clark, *supra* note 24.

One of the more controversial modern pipelines is the DAPL.[35] Owned and operated by Dakota Access,[36] the DAPL was announced publicly in 2014.[37] It transports approximately 570,000 barrels of crude oil over 1,200 miles, from the Bakken shale in North Dakota to southern Illinois.[38] From there, the oil moves through other pipelines to refineries near the Gulf of Mexico.[39] The DAPL also crosses the Missouri River at Lake Oahe, half a mile upstream from the Standing Rock Sioux reservation.[40] The land where the pipeline crosses Lake Oahe was reserved as Sioux territory in the two Treaties of Fort Laramie and later taken away from the Sioux by a congressional Act.[41] The originally proposed route would have had the pipeline run upstream from Bismarck, North Dakota, the state's capital.[42] This route was rejected by the Corps due to concerns of potential contamination to the city's water supply.[43]

C. Permitting Procedures and Permissions

Pipeline developers must comply with several permitting procedures and permissions before construction can begin.[44] Authorization for oil pipeline routes "must be granted by individual states."[45] However, many other federal approvals and permits are required, triggering agency obligations under the National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA).[46]

1. National Historic Preservation Act, Section 106

The National Historic Preservation Act was passed to protect national heritage sites from federal development.[47] It sets federal historic preservation policy, establishes partnerships between federal, state, and tribal governments, and creates

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35. *See generally* Aaron Sidder, *Understanding the Controversy Behind the Dakota Access Pipeline*, SMITHSONIAN MAG. (Sept. 14, 2016), https://www.smithsonianmag.com/smart-news/understanding-controversy-behind-dakota-access-pipeline-180960450/; *see also* Arlette Saenz and Catherine Thorbecke, *Sanders Protests Controversial Dakota Access Pipeline Outside White House*, ABC NEWS (Sept. 13, 2016, 8:28 P.M.), https://abcnews.go.com/US/sanders-protests-controversial-dakota-access-pipeline-white-house/story?id=42055322.

36. *Dakota Access Pipeline*, NS ENERGY, https://www.nsenergybusiness.com/projects/dakota-access-pipeline/. Dakota Access was a joint venture between Energy Transfer Partners, MarEn Bakken Company, and Phillips 66. *Id.*

37. Cooper Thomas, *Oil, Water, and Steel*, COOPERTHOMAS.COM, https://infinitecoop.github.io/oil-water-steel/index.html.

38. *Id.*

39. *Id.*

40. *Id.*

41. *Oil, Water, and Steel*, *supra* note 37.

42. *Id.*

43. *Id.*

44. *See generally* INTERSTATE NAT. GAS ASS'N OF AM., PIPELINE PERMITTING (2019), https://ingaa.org/wp-content/uploads/2019/01/34233.pdf.

45. Paul W. Parfomak, *Dakota Access Pipeline: Siting Controversy*, FED'N OF AM. SCIENTIST (June 15, 2017), https://sgp.fas.org/crs/misc/IN10567.pdf.

46. *Integrating NEPA and Section* 106, ADVISORY COUNCIL ON HIST. PRES., https://www.achp.gov/integrating_nepa_106.

47. *National Historic Preservation Act of 1966*, NAT'L PARK SERV. (Nov. 9, 2021), https://www.nps.gov/subjects/archeology/national-historic-preservation-act.htm.

the National Register of Historic Places and National Historic Landmarks programs.[48] In addition to recognizing national sites significant to "American history, architecture, archeology, engineering, and culture," the NHPA also recognizes sites that are significant to state and local entities.[49]

In cases where a project will affect an historic property, defined as "prehistoric or historic districts, sites, buildings, structures, or objects that are eligible for or already listed in the National Register of Historic Places," agencies must refer to Section 106 of the National Historic Preservation Act.[50] This requires agencies to take into account the effects of the project on historic properties and "to provide the Advisory Council on Historic Preservation (ACHP) with a reasonable opportunity to comment."[51] Agencies are also required to consult with "State Historic Preservation Offices (SHPO), Tribal Historic Preservation Offices (THPO), Indian Tribes (to include Alaska Natives) [Tribes], and Native Hawaiian Organizations (NHO)" on the Section 106 process.[52]

2. National Environmental Policy Act

The National Environmental Policy Act was signed into law in 1970 and requires federal agencies to engage in pre-decision assessments of the environmental impacts of their proposed actions.[53] NEPA covers a broad range of actions, including "decisions on permit applications, adopting federal land management actions, and constructing highways and other publicly-owned facilities."[54] Agencies also use the NEPA process to evaluate any social and economic impacts of their proposed projects and provide opportunities for public comment on such evaluations.[55] Agencies are required to prepare "detailed statements assessing the environmental impact" of actions that will significantly affect the environment, and any alternatives to such actions.[56] These statements are known as Environmental Impact Statements (EIS) and Environmental Assessments (EA).[57]

The President's Council on Environmental Quality (CEQ) oversees NEPA implementation.[58] The CEQ's duties involve making sure that agencies meet their NEPA obligations, overseeing "agency implementation of the environmental impact assessment process," and issuing regulations to agencies regarding NEPA compliance.[59] Many agencies have "developed their own NEPA procedures" to

48. *Id.*

49. *Id.*

50. U.S. DEP'T OF THE INTERIOR, NATIONAL HISTORIC PRESERVATION ACT, SECTION 106: A QUICK GUIDE FOR PRESERVING NATIVE AMERICAN CULTURAL RESOURCES (2012), https://home.army.mil/lewis-mcchord/application/files/9315/8040/2885/Sec._106_Process_flyer_.pdf

51. *Id.* at 1.

52. *Id.*

53. *What is the National Environmental Policy Act?*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/nepa/what-national-environmental-policy-act.

54. *Id.*

55. *Id.*

56. *Id.*

57. *What is the National Environmental Policy Act?*, *supra* note 53.

58. *Id.*

59. *Id.*

supplement the regulations provided by the CEQ that are tailored to each agency's "specific mission and activities."[60] The NEPA process may involve a lead agency, which is responsible for complying with NEPA and "supervis[ing] the preparation of the environmental analysis," and one or more cooperating agencies, which have "special expertise with respect to an environmental issue or jurisdiction by law."[61] In order for an oil pipeline's construction to be proper, the Corps must comply with NEPA's environmental documentation requirements.[62]

D. Relevant Treaties and Acts

Several Acts and Treaties are relevant to the Dakota Access Pipeline controversy.[63] In 1851, the first Treaty of Fort Laramie was signed between the U.S. government and twenty-one Great Plains tribal chiefs.[64] The treaty called for peaceful relations between the tribes and the federal government, government right to establish roads and posts within tribal territories, government protection of the tribes from attack by non-Indians, boundaries of tribal territories, and government annuities to be paid to the tribes.[65] In 1868, a second Treaty of Fort Laramie was signed recognizing "the Black Hills as part of the Great Sioux Reservation, set aside for exclusive use" by the Sioux.[66] It also guaranteed the "'undisturbed use and occupation'" of reservation lands for the Sioux.[67] Areas of the DAPL run through the "1851 territories of tribal bands that make up" the Standing Rock Sioux, Cheyenne River Sioux, and Yankton Sioux Tribes, as well as the Great Sioux Reservation outlined in the second Treaty of Fort Laramie.[68]

In 1889, Congress divided the Great Sioux Reservation into six smaller reservations, which remain intact today.[69] However, this did not invalidate the Fort Laramie treaties due to the Supremacy Clause,[70] lack of explicit congressional repeal, and U.S. Supreme Court holdings that subsequent treaties do not invalidate earlier treaties "unless the new treaty specifically addresses and removes the terms of the older treaty."[71] This means that the lands that the DAPL crosses are still guaranteed to the Sioux for their undisturbed use and occupation.[72]

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60. *Id.*

61. *What is the National Environmental Policy Act?*, *supra* note 53.

62. *See generally* Nicole T. Carter et al., OIL AND NATURAL GAS PIPELINES: ROLE OF THE U.S. ARMY CORPS OF ENGINEERS, CONG. RES. SERV. (2017), https://crsreports.congress.gov/product/pdf/R/R44880.

63. *Standing Rock Sioux Tribe*, 255 F. Supp. 3d 101; Complaint, Standing Rock Sioux Tribe v. U.S. Army Corps of Eng'rs, No. 1:16-cv-01534 (D.D.C. 2016).

64. *Fort Laramie Treaty of 1851 (Horse Creek Treaty)*, NAT'L PARKS SERV., https://www.nps.gov/articles/000/horse-creek-treaty.htm.

65. *Id.*

66. *Sioux Treaty of 1868*, NAT'L ARCHIVES, https://www.archives.gov/education/lessons/sioux-treaty.

67. *Treaties Still Matter: The Dakota Access Pipeline*, SMITHSONIAN NAT'L MUSEUM OF THE AM. INDIAN (2018), https://americanindian.si.edu/nk360/plains-treaties/dapl.

68. Jenny Schlecht, *1851 treaty resonates in DAPL discussion*, BISMARCK TRIB. (Nov. 10, 2016), https://bismarcktribune.com/news/state-and-regional/1851-treaty-resonates-in-dapl-discussion/article_e9bd6a47-e14e-507e-bb0a-8ee29eb30c9e.html.

69. *Id.*

70. *Id.*

71. *Id. See* Minnesota v. Mille Lacs Band of Chippewa Indians, 526 U.S. 172 (1999).

72. *See* Schlecht, *supra* note 68; *see also Mille Lacs Band of Chippewa Indians*, 526 U.S. 172.

In 1978, the American Indian Religious Freedom Act (AIRFA) was enacted by Congress.[73] The Act protects the right for Indians to exercise their traditional religions by ensuring "access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites."[74] Such sites may trigger review under Section 106 of the NHPA due to potential eligibility "for inclusion in the National Register."[75]

In 1990, Congress passed the Native American Graves Protection and Repatriation Act (NAGPRA).[76] The Act provides for the "repatriation and disposition of certain Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony" and recognizes that "human remains and other cultural items removed from Federal or tribal lands" belong firstly to the respective descendants and tribes.[77] The Act encourages a dialogue between museums and tribes to promote a greater understanding between the two while also recognizing museums' societal functions in preserving the past.[78]

III. ANALYSIS

A. Factual and Procedural History

In June 2014, Dakota Access, notified the Army Corps of Engineers of its intent to construct a portion of the Dakota Access Pipeline under Lake Oahe.[79] In order to receive permission for construction, it needed "three authorizations from the Corps: (1) verification that its activities satisfied NWP 12; (2) permission under the RHA; and (3) a real-estate easement under the MLA."[80] In December 2015, the Corps published a Draft EA that evaluated the environmental effects of DAPL's proposed crossing of Lake Oahe.[81] It determined that there would be no significant environmental impacts, despite the Standing Rock and Cheyenne River tribes' concern that the Corps had not sufficiently analyzed the "risks and consequences of an oil spill" and concerns from the Department of the Interior and the EPA.[82] Both tribes and the Interior "requested that the Corps prepare an EIS."[83] The Interior criticized the Corps for not adequately justifying its conclusion "that

73. 42 U.S.C. § 1996 (1978).

74. *Id.*

75. AMERICAN INDIAN RELIGIOUS FREEDOM ACT, NOAA (2011), https://coast.noaa.gov/data/Documents/OceanLawSearch/Summary%20of%20Law%20-%20American%20Indian%20Religious%20Freedom%20Act.pdf.

76. 25 U.S.C. §§ 3001-3013 (1990).

77. *Native American Graves Protection and Repatriation Act: Facilitating Respectful Return*, NAT'L PARKS SERV., https://www.nps.gov/subjects/nagpra/index.htm (last updated May 23, 2022).

78. *Id.*

79. *Standing Rock Sioux Tribe*, 985 F.3d 1032, 1040.

80. *Standing Rock Sioux Tribe*, 255 F. Supp. 3d 101, 114.

81. *Standing Rock Sioux Tribe*, 985 F.3d at 1040.

82. *Id.*

83. *Standing Rock Sioux Tribe*, 255 F. Supp. 3d at 115.

there would be no significant impacts" to the surrounding area, and the EPA requested additional information and mitigation be added to the EA due to lack of "sufficient analysis of direct and indirect impacts to water resources."[84]

On July 25, 2016, eight months after releasing its Draft EA, the Corps published a Final EA and a Mitigated Finding of No Significant Impact (Mitigated FONSI).[85] It concluded that the crossing at Lake Oahe would not "'significantly affect the quality of the human environment'" and, therefore, an EIS was not necessary.[86] It then verified that the pipeline activities satisfied NWP 12 and "granted permission under Section 408 of the Rivers and Harbors Act" for the pipeline's placement at Lake Oahe.[87]

1. Filing of Suit

Two days after the Corps released the Final EA, Standing Rock filed suit in the U.S. District Court for the District of Columbia against the Corps for declaratory and injunctive relief "pursuant to the [NHPA], [NEPA], [the CWA], and the [RHA]."[88] The complaint also alleged, among other things, that the consultation procedures the Corps adopted to satisfy its § 106 obligations were never approved by the Advisory Council on Historic Preservation, and were therefore invalid.[89] Dakota Access intervened in support of the Corps, and Cheyenne River intervened as a Plaintiff.[90] "The tribes initially sought a preliminary injunction based solely on the NHPA, contending principally that the clearing and grading of land along the pipeline route desecrated sites sacred to them."[91] After the district court denied that motion, "the Departments of Justice, the Interior, and the Army issued a joint statement" that the pipeline construction "'bordering or under Lake Oahe would not go forward' until the Army could determine whether reconsideration of any of its previous decisions regarding the crossing under NEPA or other federal laws was necessary."[92] At that time, the Corps refused to grant the MLA easement.[93]

2. Further Consideration

The Corps' Chief Counsel prepared a memorandum as part of its internal review process that concluded that it had "'adequately considered and disclosed'" potential impacts, that its decisions were not arbitrary or capricious, and that "'supplementation of the EA . . . [was] not legally required.'"[94] On November 14, 2016, Assistant Secretary of the Army for Civil Works Jo-Ellen Darcy informed Standing Rock and Dakota Access that the Army had completed its review and had

84. *Id.*

85. *Standing Rock Sioux Tribe*, 985 F.3d at 1041.

86. *Id.*

87. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 116.

88. *Id.* at 116-17.

89. Complaint for Declaratory and Injunctive Relief at 9, Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers, 255 F. Supp. 3d 101 (D.D.C. 2017) (No. 1:16-cv-01534), 2016 WL 4033936.

90. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 117.

91. *Id.*

92. *Id.*

93. *Id.*

94. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 117.

concluded that its previous decisions satisfied legal requirements.[95] The Army then invited Standing Rock to discuss potential conditions that would "'enhance the protection of Lake Oahe, the Tribe's water supplies, and its treaty rights,'" among other things.[96]

On November 16, Darcy and other Corps officials met with representatives from the Great Plains Tribal Chairpersons' Association to confirm that the correspondence "'constituted an invitation to the [T]ribes to provide any new information . . . relevant to the Corps' consideration of the easement.'"[97] Further comments were offered by Standing Rock.[98] The Corps' Omaha District Commander met with Standing Rock and Dakota Access representatives to review the tribe's concerns and discuss conditions that could be imposed to reduce spill risks.[99] The next day, the District Commander recommended that the Corps grant the easement.[100]

The Corps also solicited the opinion of the Department of the Interior regarding the "extent to which tribal treaty rights" weighed for or against authorizations for the crossing.[101] The Interior's Solicitor recommended that the Corps not decide whether to issue the easement before consulting with the tribe; prepare an EIS; and more comprehensively assess the pipeline's tribal impact "in light of the fact that the reservation is a permanent homeland for the Tribes, as well as other federal obligations towards the Tribes."[102] That same day, Darcy issued a memorandum to the Corps' Commander stating that the Army had "not made a final decision on whether to grant the easement."[103] On January 18, 2017, she published a notice of intent in the Federal Register to prepare an EIS.[104]

3. A New Administration

On January 24, soon after taking office, President Trump issued a memorandum directing the Army to expedite approval for the construction and operation of the DAPL, and to consider whether to rescind or modify the notice of intent to prepare an EIS.[105] After completing a technical and legal review on February 3, the Army determined that the Final EA and FONSI satisfied NEPA requirements and "'support[ed] a decision to grant an easement.'"[106] It further determined that the Final EA "did not require further supplementation" and published a "notice of termination of its intent to prepare an EIS."[107] After providing notice to Congress,

95. *Id.*
96. *Id.* at 118.
97. *Id.*
98. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 118.
99. *Id.*
100. *Id.* at 118.
101. *Id.*
102. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 118-19.
103. *Id.* at 119.
104. *Id.*
105. *Id.*
106. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 119.
107. *Id.* at 119-20.

the Corps issued an easement on February 8.[108] Dakota Access completed construction of the segment beneath Lake Oahe in late March, and the pipeline "became fully operational on June 1, 2017."[109]

4. Response to DAPL Construction

Cheyenne River filed a Second Amended Complaint and a motion for preliminary injunction and application for a temporary restraining order, which Standing Rock joined.[110] The district court denied the motions.[111] Standing Rock moved for "leave to amend its Complaint to address new developments" since July 2016, and then filed a Motion for Partial Summary Judgment on claims concerning "the Corps' decision not to prepare an EIS . . . ; its granting of the easement; and its permitting of the Lake Oahe crossing under NWP 12."[112] The Corps responded with a Cross-Motion for Partial Summary Judgment, and Dakota Access joined.[113] Cheyenne River joined Standing Rock's Motion and filed its own Motion for Partial Summary Judgment on claims concerning "the Corps' decisions to grant Dakota Access a permit under Section 408 of the RHA and an easement under the MLA."[114] The Corps and Dakota Access then cross-moved for partial summary judgment on those claims.[115]

5. District Court Decision and Subsequent Appeal

The district court ultimately ordered the Corps to conduct an EIS, vacated the pipeline's easement, and ordered that the pipeline be shut down and emptied of oil.[116] The Corps and Dakota Access appealed to the U.S. Court of Appeals for the D.C. Circuit in order to challenge the district court's conclusion.[117]

B. Appellate Court Analysis

The Corps and DAPL criticized the court's analogizing to its decision in *National Parks*, which held that in order for a decision to be highly controversial, a substantial dispute must exist as to the "size, nature, or *effect* of the major federal action," and there must be something more beyond the fact that some people might be agitated enough to go to court about it.[118] They argued that the Corps' efforts to respond to the Tribes' criticisms were not superficial.[119] The court responded that it had not taken a position on the matter, only that it noted that other agencies

108. *Id.* at 120.
109. *Id.*
110. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 120.
111. *Id.*
112. *Id.*
113. *Id.*
114. *Standing Rock Sioux Tribe*, 225 F. Supp. 3d at 120-21.
115. *Id.* at 121.
116. *Standing Rock Sioux Tribe*, 985 F.3d at 1042.
117. *Id.*
118. *Id.* at 1042 (quoting Nat'l Parks Conservation Ass'n v. Semonite, 916 F.3d 1075 (D.C. Cir. 2019)).
119. *Id.* at 1043.

had expressed such concerns.[120] It further stated that the Corps' position regarding the superficiality of its efforts did not comport with the court's statement in *National Parks* that the deciding factor is whether the agency has not only addressed, but resolved the controversy surrounding its analysis.[121]

The Corps and DAPL also argued that in the current case, the criticism came from the Tribes and their consultants rather than from disinterested public officials as in *National Parks*.[122] The court responded by explaining that the Tribes are not merely not-in-my-backyard neighbors, but sovereign nations with stewardship responsibilities over the natural resources implicated by the project.[123] The court further explained that while the Tribes are not the federal government, it emphasized in *National Parks* that entities other than the federal government play an important role, and that the Tribes qualified as such.[124]

The court then turned to four aspects of the Corps' analysis that, according to the district court, involved unresolved scientific controversies regarding NEPA's highly controversial factor:[125] DAPL's leak detection system and operator safety record, winter conditions, and worst case discharge.[126]

1. DAPL's Leak Detection System

The Corps pointed out that the 2012 PHMSA study relied on by the district court did not reflect an 80 percent failure rate, but rather that in 80 percent of all incidents, the monitoring system used by DAPL was not the first to detect a leak.[127] However, the court stated that the fact that DAPL's monitoring system was eclipsed by visual identification cast serious doubt on the Corps' assurance that the system will detect leaks within seconds.[128] In fact, the study explained that the type of monitoring system used by DAPL did not respond more often than personnel or members of the public passing by pipeline leaks.[129] The court further stated that the Corps' failure to address the disconnect between its representations about the system and the results of the PHMSA study was especially significant since visual identification will be unlikely to make up for deficiencies in the monitoring system due to the fact that the pipeline is buried deep underground.[130] The court also emphasized several instances where pipelines leaked for days after similar detection systems failed, including an instance involving DAPL's own operator, concluding that there is adequate reason to believe that such a leak could cause substantial harm.[131]

120. *Standing Rock Sioux Tribe*, 985 F.3d at 1043.
121. *Id.* at 1043.
122. *Id.*
123. *Id.* at 1043-44.
124. *Standing Rock Sioux Tribe*, 985 F.3d at 1044.
125. *Id.*
126. *Id.*
127. *Id.* at 1045.
128. *Standing Rock Sioux Tribe*, 985 F.3d at 1045.
129. *Id.*
130. *Id.*
131. *Id.*

2. DAPL's Operator Safety Record

The court agreed with the district court that the Corps' decision to rely on general pipeline safety data rather than DAPL's operator's safety record in regard to its risk analysis rendered the Corps' decision highly controversial.[132] DAPL's operator was described as having one of the lower performing safety records of any pipeline operator for spills.[133] The Corps made two arguments in response.[134] The first was that 70 percent of the operator's accidents were minor and limited to the operator's property.[135] However, the court explained, this did not address the 30 percent of spills that were not limited to operator property and "the criticism that the spill analysis should have incorporated the operator's record."[136] The second argument was that the Corps did not need to address the operator safety controversy at all because the Court should have deferred to the agency's technical judgment.[137] The court explained that Supreme Court precedent had previously stated that agencies must explain why they choose to exercise their discretion in the manner that they do, and that the Corps did not make such an effort in the present case.[138]

3. Winter Conditions

The Corps argued that its non-quantitative response to a winter spill scenario was adequate, so it did not need to conduct a quantitative evaluation.[139] The court, however, declared the agency's lack of attempt at explaining its conclusion as insufficient.[140] The Corps continued, arguing that the Tribes did not present a specific alternative for incorporating winter conditions into its spill response modeling.[141] The court countered that this did not justify the Corps discounting "relevant, serious criticism" of its analysis, and that the Corps cannot "foist its duty to consider such technical matters onto commenters who point out valid deficiencies."[142]

4. Worst Case Discharge

The Corps argued here that an accident leading to a large rupture was extremely unlikely, and that no statute or regulation required it to calculate a worst case discharge.[143] The court agreed with the district court that because the Corps performed such a calculation and relied on it in its analysis, it could not dispel

132. *Standing Rock Sioux Tribe*, 985 F.3d at 1046.
133. *Id.*
134. *Id.*
135. *Id*.
136. *Standing Rock Sioux Tribe*, 985 F.3d at 1046
137. *Id.* at 1047.
138. *Id.*
139. *Id.*
140. *Standing Rock Sioux Tribe*, 985 F.3d at 1047.
141. *Id.* at 1048.
142. *Id.*
143. *Id.*

doubts about its methods by simply stating that it did not need to use such a calculation anyway.[144] It concluded that the agency's failure to explain why it did not consider human errors or technical malfunctions, as well as why its conservative assumption model counterbalanced the spill risks, left unresolved the dispute as to its worst-case discharge calculation.[145]

The court further stated that although risk of a leak is low, the risk is sufficient "'that a person of ordinary prudence would take it into account in reaching a decision'" to approve the pipeline's placement.[146]

5. Challenge to the District Court's Remedy

Regarding the district court's order requiring the Corps to prepare an EIS, the Corps argued that implicating the highly controversial factor did not mandate preparation of an EIS.[147] The court countered by stating that this case was like *National Parks* in that an EIS was ordered when the Corps failed to make a case that an EIS was unnecessary, both cases presented the exact circumstances for which Congress intended to require an EIS, and the context of the present case weighed in favor of an EIS.[148]

Regarding vacatur of the easement, the court explained that ordinary practice is to vacate unlawful agency action.[149] However, courts may exercise discretion to leave an agency action in place while the decision is remanded depending on the seriousness of the order's deficiencies and the disruptive consequences of an interim change.[150] As to the seriousness of the deficiency, the district court concluded that resolution of the controversies on remand was unlikely because the Corps had failed to resolve them on remand previously, and that the Corps focused on whether it could justify its easement decision rather than its decision not to conduct an EIS.[151]

As to the disruptive consequences of vacatur, the district court noted that shutting down pipeline operations would result in significant economic harm, but nonetheless concluded that that did not justify remanding without vacatur for four reasons: (1) the Corps' expedited EIS preparation timeline would slow economic disruption of a shutdown, (2) economic disruption is not on its own a basis for declining to vacate agency action, (3) Dakota Access' approach would undermine NEPA's objectives, and (4) the risk of a spill counseled in favor of vacatur.[152]

Regarding the district court's order to have the pipeline shut down and emptied of oil, the appellate court explained that the district court had not made the necessary findings for injunctive relief "under the traditional four-factor test."[153]

144. *Standing Rock Sioux Tribe*, 985 F.3d at 1048.
145. *Id.* at 1049.
146. *Id.* at 1050 (quoting Sierra Club v. FERC, 827 F.3d 36, 47 (D.C. Cir. 2016)).
147. *Id.* at 1050.
148. *Standing Rock Sioux Tribe*, 985 F.3d at 1050.
149. *Id.*
150. *Id.* at 1051.
151. *Id.*
152. *Standing Rock Sioux Tribe*, 985 F.3d at 1051.
153. *Id.* at 1053 (quoting Monsanto Co. v. Geertson Seed Farms, 561 U.S. 139, 158 (2010)).

While the Tribes argued that an injunction was unnecessary because vacatur itself invalidated the easement, this approach did not comport with *Monsanto Co. v. Geertson Seed Farms*, which instructed that "a court must determine that an injunction *should* issue under the traditional four-factor test."[154] The court further explained that with or without oil flowing, the pipeline would remain an encroachment on federal land, and there is no other instance in which a court had to determine "whether an easement already in use . . . must be vacated on NEPA grounds."[155]

6. Appellate Court Decision

The court affirmed the district court's order vacating the easement and directing the Corps to prepare an EIS, but reversed that court's order directing that the pipeline be shut down and emptied.[156]

C. Argument for Injunction and Pipeline Shutdown

According to the Supreme Court in *Monsanto*, a party seeking permanent injunction must satisfy a four-factor test before such relief may be granted.[157] The party must demonstrate

> (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.[158]

1. Irreparable Injury Prong

The D.C. Circuit in *Standing Rock* ruled that vacatur did not automatically result in removal of oil from the pipeline and the Tribes would still need to satisfy the four-part test for a permanent injunction to get that type of relief.[159] In so ruling, therefore, the Court did not address the fact that there were twelve spills, resulting in 6,000 barrels of leaked oil, in the first eighteen months of the pipeline's operation or whether those facts might establish irreparable harm.[160] As of October, 2020, North Dakota, Iowa, and Illinois regulators approved expanding the pipeline, which doubled its capacity to 1.1 million barrels of oil per day.[161] And,

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154. *Id.* at 1053-54 (quoting *Monsanto*, 561 U.S. at 158).

155. *Id.*

156. *Standing Rock Sioux Tribe*, 985 F.3d at 1054.

157. *Monsanto Co.*, 561 U.S. at 156.

158. *Id.* at 156-57 (quoting eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391 (2006)).

159. *Standing Rock Sioux Tribe*, 985 F.3d at 1054.

160. Dan West & Jennifer Sass, *Huge Win for Standing Rock and the National Environmental Policy Act*, NRDC (Mar. 25, 2020), https://www.nrdc.org/experts/dan-west/huge-win-standing-rock-and-national-environmental-policy-act.

161. Kristin Lam, *North Dakota OKs expanding Dakota Access Pipeline, setting up legal fight with Standing* Rock, USA TODAY (Feb. 19, 2020, 7:50 PM), https://www.usatoday.com/story/ news/nation/2020/02/19/dakota-access-pipeline-expansion-approved/4812580002/; Susan Cosier, *Expand the DAPL? Only Illinois Stands in the* Way, NRDC (May 5, 2020), https://www.nrdc.org/stories/expand-dapl-only-illinois-stands-way; *Illinois*

Energy Transfer expects to have expanded capacity available by the third quarter of 2021.[162] This development will require "more pumping stations and significantly increase[s] the pressure inside the pipeline," greatly increasing the risk of a spill.[163] These factors too may be relevant in ruling on whether a permanent injunction warranting removal of oil from the pipeline should be required to redress irreparable harm.

2. Inadequate Remedies, Balance of Hardship, and Public Interest

Regarding the inadequate remedies prong of the four-part test that will be before the district court, "damage theory is predicated on a theory of economic inadequacy."[164] Certain considerations, such as lost profits from a new business, are too speculative to properly award monetary damages.[165] Courts have attempted to address this economic inadequacy problem by forgoing money damages and enjoining "to vindicate the legally recognized but subjective . . . impairment" which damages doctrine fails to consider.[166] Pollution actions, such as the present case, clearly illustrate the inadequacy of monetary compensation.[167] Seeing as how the injury experienced by the Tribes affects public health,[168] remedies at law are unlikely to adequately compensate for such injury.

When addressing a permanent injunction, courts will assess and balance the relative hardships that the parties will endure if an injunction is granted or denied.[169] The effect on third parties is considered irrelevant.[170] Given the environmental, health, and safety considerations facing the Tribes,[171] they will be forced to endure a greater hardship than the economic hardship experienced by Dakota Access and the oil industry if the injunction is not granted.[172]

Given that Lake Oahe feeds into the Missouri River, creating the longest river system in the country relied upon by several Midwestern states,[173] shutting down the pipeline and therefore eliminating the risk of a catastrophic spill would benefit the public interest rather than disserve it.[174]

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approves expansion of Dakota Access oil pipeline, REUTERS (Oct. 15, 2020, 10:59 AM), https://www.reuters.com/article/us-energy-transfer-oil-pipeline-illinois/illinois-approves-expansion-of-dakota-access-oil-pipeline-idUSKBN2702DL.

162. *Illinois approves expansion of Dakota Access oil pipeline*, *supra* note 161.

163. West & Sass, *supra* note 160.

164. Doug R. Rendleman, *The Inadequate Remedy at Law Prerequisite for an Injunction*, 33 U. FLA. L. REV. 346, 349 (1981).

165. *Id.*

166. *Id.*

167. *Id.* at 350.

168. *See* West & Sass, *supra* note 160; *see also Standing Rock*, 985 F.3d at 1046.

169. Jean Dassie, *Federal Circuit on balancing the hardships for a post-eBay injunction*, FED. CIR. ON DAMAGES AND OTHER REMEDIES (Sept. 9, 2016), http://www.fedcirdamages.com/federal-circuit-on-balancing-the-hardships-for-a-post-ebay-injunction/.

170. *Id.*

171. *See* West & Sass, *supra* note 160; *see also Standing Rock Sioux Tribe*, 985 F.3d at 1046; *Standing Rock Sioux Tribe*, 255 F. Supp. 3d at 114.

172. *Standing Rock Sioux Tribe*, 985 F.3d at 1051.

173. *Lake Oahe, South Dakota*, *supra* note 13; *Missouri River*, *supra* note 16.

174. *See* West & Sass, *supra* note 160.

D. Waiting to Shut Down the Pipeline Will Harm the Tribe

Here, the D.C. Circuit Court of Appeals did not address the question of irreparable harm because it found that vacatur of the easement did not itself imply that the pipeline had to be shut down.[175] This it added, however, did not mean that the Tribe was without recourse:

> It may well be—though we have no occasion to consider the matter here—that the law or the Corps's regulations oblige the Corps to vindicate its property rights by requiring the pipeline to cease operation and that the Tribes or others could seek judicial relief under the APA should the Corps fail to do so. But how and on what terms the Corps will enforce its property rights is, absent a properly issued injunction, a matter for the Corps to consider in the first instance, though we would expect it to decide promptly.[176]

The problem created for the Tribes by this ruling is that while the injunction litigation proceeds, the pipeline will continue to fully operate while trespassing on federal lands.[177] Given the poor safety record of the operator the court's narrow reading of the scope of vacatur may set a dangerous precedent for future environmental justice situations.

E. Future Implications for Environmental Justice

Water is a critical resource to tribes, and it affects the "physical, cultural, and economic wellbeing" of those who reside on or near tribal lands.[178] Native Americans are at a higher risk for health issues resulting from water contamination compared to other populations,[179] and quality water resources are essential for economic growth in Indian Country.[180] Former Commission of Civil Rights chair Martin Castro has stated that "the issues raised by the pipeline relate[d] to 'the entire relationship between the United States and sovereign Indian Nations, their rights, traditions[,] and religious beliefs.'"[181] According to legal scholar Mary Kathryn Nagle, NEPA failed to achieve an outcome requiring the federal government and Dakota Access to respect the Tribe's inherent sovereignty.[182]

The pipeline continues to operate as usual, despite the fact that it is trespassing on federal land.[183] Because the court has allowed Dakota Access to continue its operations and held that vacatur was not enough to shut down the pipeline, the

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175. *Standing Rock Sioux Tribe*, 985 F.3d at 1053-54.

176. *Id.* at 1054.

177. Lawrence Hurley, *Dakota Access Pipeline suffers U.S. Supreme Court setback*, REUTERS (Feb. 22, 2022), https://www.reuters.com/business/energy/us-supreme-court-turns-away-dakota-pipeline-operators-appeal-2022-02-22/.

178. U.S. COMM'N ON CIVIL RIGHTS, BROKEN PROMISES: CONTINUING FEDERAL FUNDING SHORTFALL FOR NATIVE AMERICANS 181 (2018), https://www.usccr.gov/files/pubs/2018/12-20-Broken-Promises.pdf.

179. *Id.* at 182.

180. *Id.* at 183.

181. *Id.* at 185.

182. Mary Kathryn Nagle, *Environmental Justice and Tribal Sovereignty: Lessons from Standing Rock*, 127 YALE L.J. 667, 668 (2018).

183. *See Standing Rock Sioux Tribe*, 985 F.3d at 1054.

unfortunate consequence is to delay resolution of the case until a permanent injunction can be litigated, which will result in serious interim harm and potentially disastrous environmental justice consequences.

IV. CONCLUSION

In *Standing Rock Sioux Tribe*, the D.C. Circuit reversed the District Court's decision regarding the order to shut down the Dakota Access Pipeline and empty it of oil.[184] At the heart of the Court's decision was its determination that the scope of vacatur was narrower in the case of federal easements than it was where construction and operating permits or certificates were unlawfully issued.[185] The tribes had argued that an injunction was unnecessary because vacatur of the easement necessarily implied that the pipeline would have to suspend operations. [186] And they had reasonable grounds to think so. Only a few years earlier, the same Court had "vacated a [natural gas] pipeline authorization due to a NEPA violation"[187] and had also "appeared to accept the parties' assumption that vacating Corps-issued construction permits would require ceasing construction of the challenged electrical towers or tearing them down."[188] But, the Court explained, "[t]hose cases involved challenges to agency authorizations of the very activities the court assumed would end"—namely authorizations to construct and operate facilities.[189] By contrast, in this "quite unusual case" the pipeline being challenged would remain an encroachment, "with or without oil flowing."[190] In essence, the court refused to affirm the shutdown order because the issue of whether to vacate an easement already in use, as opposed to vacatur of an operating or construction license or permit, is a case of first impression.[191]

The court explained that the law or the Corps' regulations might require the Corps to "vindicate its property rights by requiring the pipeline to cease operation," but that this was a matter for the Corps to consider itself.[192] Despite the Court's expectation that the agency would deal with the issue "promptly,"[193] one might reasonably be skeptical that the agency will act with alacrity, given that its failure to conduct an environmental review had been remanded to the agency numerous times with no result.[194]

The case provides a cautionary tale for those with solid cases challenging an agency's failure to comply with NEPA before granting easements as opposed to

184. *Id.* at 1032.

185. *Id.* at 1054.

186. *Id.* at 1053.

187. *Standing Rock Sioux Tribe*, 985 F.3d at 1054 (citing Sierra Club v. FERC, 867 F.3d 1357, 1379 (D.C. Cir. 2017)).

188. *Id.* (citing National Parks Conservation Ass'n v Semonite, 925 F.3d 500, 502 (D.C. Cir. 2019)).

189. *Id.* at 1054.

190. *Id.*

191. *Standing Rock Sioux Tribe*, 985 F.3d at 1054.

192. *Id.*

193. *Id.*

194. *Id.* at 1051; *see also* Jan Hasselman, *DAPL Update: Tribe Asks Court to Shut Down DAPL Due to Failed Remand; Massive Pipeline Expansion Planned*, EARTHJUSTICE (Mar. 18, 2020), https://earthjustice.org/feature/dakota-access-pipeline-legal-explainer-remand.

operating or construction permits. Parties in this posture would be well advised to seek expedited action on permanent injunctions at the same time they seek vacatur. That extra step may be needed to ensure that agencies will adequately comply with NEPA and similar statutes before and during project construction in the future,[195] not only when it comes to projects with tribal impacts, but those impacting minority and low-income communities as well.[196]

Megan Wagner[*]

195. West & Sass, *supra* note 160.

196. *See generally Hearing on Envtl. Just. In Indigenous Cmtys.: Before the H. Comm. on Nat. Res. Comm. Subcomm. for Indigenous Peoples of the U.S.* (2021) (testimony of Ira Taken Alive, Vice-Chairman, Standing Rock Sioux Tribe).

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The 2022-2023 student executive board. Pictured (starting from left to right) are Cheyenne Barnard, Megan Wagner, Rachel Cory, Emory Fullington, and Sotheby Shedeck.

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