

Private Environmental Governance in Healthcare

Proposing and Propagating Decarbonization Plans for Healthcare Centers



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INTRODUCTION

The 2020s have been marked by an unprecedented joint public-private effort to decarbonize. Powerful corporate players have joined national, state, and local governments in committing to rapid decarbonization.¹ However, the goals of 50% reductions by 2030 and net zero by 2050² will be challenging to reach without major, near-term reductions in emissions from the healthcare sector. Healthcare represents a significant portion of the U.S. economy³ and contributes 10% of U.S. greenhouse gasses.⁴ Yet healthcare faces unique barriers to decarbonization, and the uptake of environmental initiatives has been slow and sporadic.⁵

I. U.S. HEALTHCARE AND THE ENVIRONMENT

A. Healthcare in the United States

The United States spends more on health care than any other developed country.⁶ Healthcare spending comprised more than 15 percent of the U.S. GDP, or over \$10,000 per

¹ See, e.g., Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104 (describing public national commitments to decarbonize); Michael P. Vandenbergh, *The New Wal-Mart Effect: The Role of Privacy Contracting in Global Governance*, 54 UCLA L. REV. 913 (2007) (describing the role of private contracting in standard setting); Michael P. Vandenbergh, *Private Environmental Governance*, 99 CORNELL L. REV. 129 (2013) (describing use of private governance in environmental progress).

² Exec. Order No. 14058, 86 C.F.R. 70935 (2021) (“It is therefore the policy of my Administration for the Federal Government to lead by example in order to achieve a carbon pollution-free electricity sector by 2035 and net-zero emissions economy-wide by no later than 2050.”).

³ See *infra* notes 7-8.

⁴ HEALTHCARE WITHOUT HARM, HEALTH CARE’S CLIMATE FOOTPRINT 22 (2019) available at <https://noharm-global.org/sites/default/files/documents-files/5961/HealthCaresClimateFootprint090619.pdf> [hereinafter FOOTPRINT]

⁵ Andrew Jameton, *Is a Modest Health Care System Possible?* 44 SYNTHESIS/REGENERATION (2007), available at <http://www.greens.org/s-r/44/44-08.html>.

⁶ Roosa Tikkanen, *Multinational Comparisons of Health Systems Data*, 2019, COMMONWEALTH FUND (Jan. 30, 2020), <https://www.commonwealthfund.org/publications/other-publication/2020/jan/multinational-comparisons-health-systems-data-2019>; see also Roosa Tikkanen & Melinda K. Abrams, *U.S. Health Care From a Global Perspective, 2019: Higher Spending, Worse Outcomes?*, COMMONWEALTH FUND (Jan. 30, 2020), <https://www.commonwealthfund.org/publications/issue-briefs/2020/jan/us-health-care-global-perspective-2019>. This reflects healthcare spending as a percentage of GDP, adjusted for differences in cost of living, compared to OECD countries.

capita, before the start of the COVID-19 pandemic.⁷ 12 percent of Americans work in the healthcare industry.⁸ Beyond economic effects, healthcare systems hold powerful community-shaping positions: they provide not only health services and employment but increasingly provide social services⁹ and serve as trusted arbiters of scientific information.¹⁰ However, while the healthcare system bears the burden of many environmental crises, it is also a significant source of greenhouse gasses and other deadly environmental emissions.¹¹

The United States is the global leader in healthcare carbon emissions.¹² The United States healthcare system's carbon emissions not only outpace those of any other country¹³ but does so by a significant proportion. In 2014, U.S. healthcare emissions per capita were an entire ton more than the global average.¹⁴ A 2016 study by the Yale School of Medicine and Northwestern University showed that if the U.S. healthcare sector were its own country, it would rank 13th in GHG emissions globally—more than the United Kingdom.¹⁵

⁷ *Id.* (16.9% for 2018). Andrew Jameton, a leading environmental health scholar, puts the statistic at closer to 15%. See Jameton, *supra* note 5.

⁸ Jay Lemery et. al, *Training Clinical and Public Health Leaders in Climate and Health*, 39:12 HEALTH AFFS. 2189 (Dec. 2020).

⁹ See, e.g., Phil Galewitz, *In Health Care, More Money is Being Spent on Patients' Social Needs. Is it Working?*, NPR (June 21, 2021) <https://www.npr.org/sections/health-shots/2021/06/21/998578876/in-health-care-more-money-is-being-spent-on-patients-social-needs-is-it-working>.

¹⁰ See, e.g., U.S. SURGEON GENERAL, CONFRONTING HEALTH MISINFORMATION 10 (2021) available at <https://www.hhs.gov/sites/default/files/surgeon-general-misinformation-advisory.pdf> (citing Megan Brennan, *Nurses Again Outpace Other Professions for Honesty*, ETHICS, GALLUP (Dec. 20, 2018),

<https://news.gallup.com/poll/245597/nurses-again-outpace-professions-honesty-ethics.aspx/> (“doctors, nurses, and other clinicians are highly trusted and can be effective in addressing health misinformation.”); see also Lemery et. al, *supra* note 8 at 2189.

¹¹ Jodi D. Sherman, Andrea MacNeill & Cassandra Thiel, *Reducing Pollution from the Healthcare Industry*, 322 JAMA 1043 (Aug. 2, 2019).

¹² See FOOTPRINT, *supra* note 4, at 22 (total emissions); Peter-Paul Pichler et al., *International Comparison of Health Care Carbon Footprints*, 14 ENVIRON. RES. LETT. 064004, *4 (2019) (per capita); Matthew J. Eckelman, Kaixin Huang, Robert Lagasse, Emily Senay, Robert Dubrow & Jodi S. Sherman, *Health Care Pollution and Public Health Damage in the United States: An Update*, 39 HEALTH AFFS. 2071, 2075 (2020).

¹³ See *supra* note 12.

¹⁴ Pichler et al., *supra* note 12, at *3.

¹⁵ Matthew J. Eckelman & Jodi Sherman, *Environmental Impacts of the U.S. Health Care System & Effects on Public Health*, PLOS ONE (June 9, 2016), <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0157014>.

B. The Healthcare Industry's Signaling Role

Healthcare remains one of the most trusted professions, especially when it comes to scientific information.¹⁶ Procurement and supply chain reforms can help address healthcare's rate of carbon emissions, but it can also signal to adjacent industries that decarbonization is necessary for future market viability. When healthcare facilities adopt procurement policies that favor reusable devices over single-use disposables, they can help drive innovation focused on reusable materials, helping to lower emissions or decarbonize other manufacturers and operators within the supply chain. Hospital procurement policies can also "stipulate that disclosure of product environmental emissions through life cycle assessment is a necessary condition for entering into a service contract."¹⁷ These disclosures can help drive public and consumer pressure on the medical industry to lower emissions and respond more decisively to the worsening climate crisis.

C. Environmental Impacts of Healthcare Systems

1. *Greenhouse Gases*

The healthcare system is responsible for 10 percent of U.S. carbon emissions and 9 percent of harmful non-greenhouse gas air pollutants.¹⁸ This proportional contribution is likely to increase - in a business-as-normal scenario, healthcare emissions are estimated to triple by 2050¹⁹ while other industries embrace decarbonization.²⁰

One reason hospitals' heavy energy load is their particularly intensive use of energy. Dr. Andrew Jameson, Ph.D., has studied the environmental impacts of healthcare systems and notes that many of the features we associate with the "hygienic" atmosphere of hospitals also contribute to the intensity of their energy use: bright lights, air filtration, controlled temperature levels, frequent cleaning and processing of food and laundry, among other features, are

¹⁶ See *supra* note 10.

¹⁷ Andrea J. MacNeill, et al., *Transforming The Medical Device Industry: Road Map To A Circular Economy*, 39 HEALTH AFFS. 2088, 2094 (2020).

¹⁸ Mike Cummings, *Health Care Industry is a Major Source of Harmful Emissions*, YALENEWS (Aug. 2, 2019), <https://news.yale.edu/2019/08/02/healthcare-industry-major-source-harmful-emissions>.

¹⁹ HEALTH CARE WITHOUT HARM, GLOBAL ROAD MAP FOR HEALTH CARE DECARBONIZATION, 7 (2021), available at https://healthclimateaction.org/sites/default/files/2021-06/Health%20Care%20Without%20Harm_Health%20Care%20Decarbonization_Road%20Map.pdf.

²⁰ See *infra* Section III.B.

extremely energy-intensive.²¹ Beyond these more aesthetic concerns, hospitals and healthcare centers must generate or purchase electricity for large imaging machines, computers, diagnostic devices, the synthesization and purification of pharmaceutical compounds, sanitization of tools and materials, and more.²²

Beyond the direct emissions from electricity generation and use, healthcare emissions can come from a variety of other sources, including: the transportation and incineration of chemotherapeutic agents and other pharmaceutical compounds difficult to source locally;²³ staff commuting; emissions from the procurement of medical devices and supplies; fleet vehicles (such as ambulances and helicopters); and the release of refrigerants and anesthetic gasses.²⁴

While bearing responsibility for a significant portion of U.S. emissions, hospitals are already feeling the impacts of climate change. During the 2017 and 2019 Northern California wildfires, the Kaiser Permanente health system had to evacuate more than 100 patients while maintaining care for the surrounding communities.²⁵ Flood risk and increased storm intensity have caused hospital systems to invest not only in the short-term, but long-term planning, including “moving technical equipment . . . to higher floors; organizing patient transfers in advance of catastrophes; improving energy efficiencies; better air filters; and more backup systems and redundancies.”²⁶

Climate change also changes the underlying health needs of hospital communities. Heat effects on patients with heart conditions and increases in insect or other vector-borne diseases

²¹ Jameton, *supra* note 5.

²² *Id.*

²³ *Id.* See also FOOTPRINT, *supra* note 4; Matthew Eckelman et al., *Health Care Pollution And Public Health Damage In The United States: An Update*, HEALTH AFFS. (Dec. 2020); Andrea George et al., *Vanderbilt University Inventory of Greenhouse Gas Emissions*, 2015, VANDERBILT UNIV. (2016).

²⁴ Karliner et al., *supra* note 23; Eckelman et al., *supra* note 23; George et al., *supra* note 23.

²⁵ Tatiana Schlossberg, *How Hospitals Can Help Patients and the Planet*, N.Y. TIMES (May 12, 2021), <https://www.nytimes.com/2021/05/12/health/hospitals-climate-change.html>. Increases in the intensity, frequency, and duration of wildfires are attributable to climate change. *Climate Change Indicators: Wildfires*, U.S. EPA (July 2022). <https://www.epa.gov/climate-indicators/climate-change-indicators-wildfires#:~:text=Multiple%20studies%20have%20found%20that,wildfire%20frequency%2C%20and%20burned%20area.&text=The%20wildfire%20season%20has%20lengthened,and%20drier%20soils%20and%20vegetation> (“Climate change has already led to an increase in wildfire season length, wildfire frequency, and burned area . . . climate change threatens to increase the frequency, extent, and severity of fires through increased temperatures and drought.”).

²⁶ Schlossberg, *supra* note 25.

correlate directly with rising temperatures.²⁷ Rising temperatures can also change the ways that departments prioritize or triage cases: ClimateWire quoted Dr. Jonathan Slutzman, a doctor in Boston who has seen an increase in heat-related emergencies, who:

[R]ecalled a patient he treated in early June who was mentally altered and came to the emergency room with a body temperature of 102 degrees Fahrenheit. The physician's assistant who first assessed the patient reported the man had a fever. But it was only after Slutzman spoke to the man's wife that he realized the patient had spent much of the weekend outdoors in 90-degree heat and was actually suffering from heat stroke.²⁸

Slutzman summarized the problem as being caused by the changed baseline assumptions required by climate change:

It was ingrained in the [ER's] culture here that if you see a high temperature, it's a fever... but now we have to teach our staff to reconsider this and think, "OK, but what if it is heat exposure," because the treatments are very different.²⁹

As climate changes, healthcare systems will have to pay for the transition training Dr. Slutzman mentions to adapt to corresponding changes in patient care needs.

2. Procurement and Supply Chain Impacts

About 80% of U.S. healthcare sector emissions stem from its supply chain.³⁰ Supply chain emissions can be categorized through the tripartite coding of Scope 1, 2, or 3 emissions. Scope 1 emissions are direct GHG emissions from sources that are controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles). Scope 2 emissions are indirect GHG emissions associated with purchasing electricity, steam, heat, or cooling. Although scope 2 emissions physically occur at the generation facility, they are

²⁷ Ariel Wittenbergh, *Medical Students Push for Classes On Warming's Health Impacts*, GREENWIRE (July 6, 2021 1:27 PM), <https://www.eenews.net/articles/medical-students-push-for-classes-on-warmings-health-impacts/>. Vector-borne diseases are especially concerning - scientists predict that climate change and habitat degradation increases the range of specific carriers (like the ticks that bear Lyme Disease) as well as the likelihood of human-animal contact. *See generally*, Joacim Rocklov & Robert Dubrow, *Climate Change: An Enduring Challenge For Vector-Borne Disease Prevention And Control*, 21 NATURE IMMUNOLOGY 479-483 (2020); DAVID QUAMMEN, SPILLOVER: ANIMAL INFECTIONS AND THE NEXT HUMAN PANDEMIC (2012).

²⁸ Wittenbergh, *supra* note 27.

²⁹ *Id.*

³⁰ Matthew J. Eckelman, Kaixin Huang, Robert Lagasse, Emily Senay, Robert Dubrow, & Jodi D. Sherman, *Health Care Pollution And Public Health Damage In The United States: An Update* 39 HEALTH AFFS. 2071, 2075 (2020).

accounted for in an organization's GHG inventory because they result from the organization's energy use.³¹

Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but emissions that the organization indirectly impacts through its value chain. Scope 3 emissions include all sources not within an organization's scope 1 and 2 boundary. The scope 3 emissions for one organization are the scope 1 and 2 emissions of another organization. Scope 3 emissions, also called value chain emissions, often represent most of an organization's total GHG emissions.³²

For hospital systems to fully decarbonize, they must address all three emission scopes. This requires engaging with supply chain and procurement professionals to select environmentally preferable goods. By pursuing Scope 3 decarbonization, healthcare systems can drive demand for decarbonization in a variety of industries, from pharmaceuticals³³ to food served in the cafeteria³⁴ to vehicles purchased for hospital fleets.

3. *Other Emissions*

Greenhouse gasses are not the only source of pollutants for the healthcare industry. Healthcare is also responsible for 9 percent of the U.S.'s harmful non-greenhouse gas air pollutants.³⁵

These emissions directly impact the communities in which healthcare systems exist. Hospitals are required by NFPA Code 110 to have backup power for 96 hours.³⁶ This back-up power is often produced by diesel generators that produce PM 2.5, a fine particulate matter

³¹ *Scope 1 and Scope 2 Inventory Guidance*, ENV'TL PROT. AGENCY (Sept. 9, 2022), <https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance>.

³² *Scope 3 Inventory Guidance*, ENV'TL PROT. AGENCY (May 12, 2022), <https://www.epa.gov/climateleadership/scope-3-inventory-guidance>.

³³ *See, e.g., Greener Processes*, PFIZER (last visited Oct. 29, 2022), <https://www.pfizer.com/about/responsibility/green-journey/greener-processes>.

³⁴ *See Schlossberg, supra* note 25 (discussing Boston Medical Center's use of rooftop gardens to decarbonize their cafeteria).

³⁵ Cummings, *supra* note 18.

³⁶ *Standard for Emergency and Standby Power Systems*, NAT'L FIRE PROT. ASSN. (last visited Oct. 29, 2022), <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=110>. Hospitals are classified as critical facilities, which are required to have 96 hours of fuel-oil supply for an emergency standby power plant.

which can cause or exacerbate asthma.³⁷ 85,000 to 200,000 preventable deaths per year are attributable to atmospheric pollution from PM 2.5.³⁸ Pollutants resulting from diesel generators can directly impact the communities closest to hospitals because hospitals must regularly test their generators, resulting in emissions of PM 2.5.³⁹

II. PRIVATE ENVIRONMENTAL GOVERNANCE AS A TOOL FOR ENVIRONMENTAL IMPACT

A. What is Private Environmental Governance (“PEG”)?

Private Environmental Governance (“PEG”) describes governance and standards that have emerged in the private sector when solutions and regulations from the government alone have proved insufficient. While private governance can address many policy problems, PEG specifically emerged in response to Congress’s inability to pass major environmental statutes after the Clean Air Act Amendments of 1990.⁴⁰ According to Vandenberg et al., PEG involves “private organizations reducing pollution and other environmental harms, managing common pool resources, and achieving more equitable distributions of environmental harms and benefits in the absence of government intervention.”⁴¹ PEG is a broad area of governance that encompasses several industries and entities, all working to reduce negative environmental

³⁷ Hiroko Tabuchi & Nadja Popovich, *People of Color Breathe More Hazardous Air. The Sources are Everywhere*, N.Y. TIMES (Sept. 7, 2021), <https://www.nytimes.com/2021/04/28/climate/air-pollution-minorities.html>.

³⁸ *Id.*

³⁹ *Id.* A 2012 study also supports the notion that hospitals bear the burden of air pollution in their surrounding communities. The analysis, which looked at how failing to meet federal air quality standards for ozone and particle pollution (including PM 2.5) cost hospital care purchasers in California, found that meeting federal clean air standards would have prevented 29,808 hospital emissions and ER visits from 2005-2007. *See* JOHN A. ROMLEY, ANDREW HACKBARTH & DANA P. GOLDMAN, *THE IMPACT OF AIR QUALITY ON HOSPITAL SPENDING* (Rand Health 2012) available at https://www.rand.org/pubs/technical_reports/TR777.html.

⁴⁰ *1990 Clean Air Act Amendment Summary*, EPA (2021), <https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary>.

⁴¹ MICHAEL VANDENBERGH, SARAH LIGHT & JAMES SALZMAN, *PRIVATE ENVIRONMENTAL GOVERNANCE* (Foundation Press, forthcoming) at 3.

externalities.⁴² Types of organizations that may undertake PEG include businesses, investment firms, insurance brokers, non-governmental organizations (NGOs), and other private actors.⁴³

PEG can consist of various different instruments: prescriptive rules, property rights or entitlements, market-leveraging approaches, tradable permits, informational governance, emphasis on procurement or supply chains, insurance policies, and a host of other private solutions and agreements.⁴⁴ These tools parallel or reflect U.S. legislative or regulatory frameworks on environmental issues.⁴⁵ However, PEG may transcend international boundaries and political barriers in a way that public and domestic governance cannot. Opponents of PEG may argue that private initiatives are inefficient or ineffective because they lack a “leviathan”--the overarching enforcement mechanism that environmental regulation typically depends on. While it is true that PEG rarely has criminalizing authority, business incentives and disincentives can play an influential enforcement role.

B. Examples of Private Environmental Governance

One successful example of Private Environmental Governance is Target Brand, Inc.’s (“Target”) efforts to regulate the safety and sustainability of products that it permits on its store shelves. Target initially announced a chemical management framework in 2017.⁴⁶ As of 2022, the majority of Target bundles most of its sustainability commitments and ESG plans in “Target Forward.”⁴⁷ According to Target CEO Brian Cornell:

[S]ustainability is tied to business resilience and growth, and that our size and scale can drive change that is good for all. Target Forward influences every corner of our business, deepens our collaboration with our partners and builds on our past efforts to ensure a better future for generations to come.⁴⁸

Target Forward includes emissions reduction goals in scopes 1, 2, and 3; commitments to derive at least 50% of their energy from renewable sources by 2030; plans for 100% of Target-owned

⁴² *Id.* at 2. Edward Elgar, *Environmental Decision Making in* ENCYCLOPEDIA OF ENVIRONMENTAL LAW (Lee Paddock, Robert L. Glicksman, & Nicholas S. Bryner eds., 2016), available at <https://ssrn.com/abstract=2645953>.

⁴³ *Id.* at *5.

⁴⁴ *Id.* at 5-8.

⁴⁵ *Id.* at 2-5.

⁴⁶ *Target Forward: Our Sustainability Strategy, A Bullseye View*, TARGET BRANDS, INC. (last visited Oct. 29, 2022) <https://corporate.target.com/sustainability-ESG/strategy-target-forward>.

⁴⁷ *Id.*

⁴⁸ *Id.*

brands and brand partnerships to adhere to Target’s own sustainability standards by 2025; commitments to net zero greenhouse gas emissions across all three scopes by 2040; goals for zero-waste to landfills in U.S. operations by 2030; specific requirements for chemicals that are permissible in products as well as transparency regarding what chemicals are found in each product; and several other Private Environmental Governance commitments and initiatives.⁴⁹ Through its environmental governance initiatives, Target meets other PEG standards, such as the science-based targets set by the Business Ambition for 1.5°C and setting internal standards that are more strict than environmental laws that would otherwise govern its business practices.

Other examples of Private Environmental Governance include the Marine Stewardship Council (MSC) and the Forest Stewardship Council (FSC).⁵⁰ The MSC issues certifications for fisheries that meet specific MSC standards and encourages retailers and consumers to select MSC-certified seafood for sale and consumption.⁵¹ The FSC issues certifications for products and services that involve forest products at varying stages of production and advocates for zero deforestation goals and protecting biodiversity and endangered forests.⁵² Not only are the MSC and FSC filling in regulatory gaps in America’s existing framework of environmental law, but they also transcend international borders by offering global standards that may be more stringent than other countries’ domestic sustainability laws.⁵³ The standards set by both the MSC and the FSC reflect not only customers’ preferences shifting toward sustainable products, but also the fact that companies’ supply chains will be devastated in the near future if companies do not source products sustainably.

C. Private Environmental Governance and Medical Centers

The global healthcare industry accounts for an estimated 4.5 percent of all global greenhouse gas emissions and a similar proportion of toxic air pollutants caused mainly by fossil

⁴⁹ *Id.*

⁵⁰ *See supra* notes 33-34.

⁵¹ *The MSC Approach to Healthy Oceans*, MARINE STEWARDSHIP COUNCIL (last visited Oct. 30, 2022), <https://www.msc.org/en-us/what-we-are-doing/our-approach>.

⁵² *How the FSC System Works: Uniting Many Voices Under a Common Mission: Ensuring Forests for All, Forever*, FOREST STEWARDSHIP COUNCIL (last visited Oct. 30, 2022), <https://fsc.org/en/how-the-fsc-system-works>.

⁵³ *See supra* note 33-34.

fuel combustion.⁵⁴ The United States healthcare system alone is responsible for one-quarter of the greenhouse gas emissions that result from the healthcare industry.⁵⁵ Medical centers are well-positioned to use private environmental governance as a tool for decarbonization. Like corporations, medical centers face intense financial pressure, which can be alleviated with synergies in private environmental governance initiatives.⁵⁶ However, medical centers are better-positioned than most organizations to embrace PEG initiatives. Because of the regulatory pressures hospitals face, caregivers and employees are well-versed in compliance with public and private regulations in ways that firm employees may not be. Additionally, PEG for medical centers has the potential to improve or protect community health, decreasing pressure on already overburdened hospital systems.

III. BENEFITS TO MEDICAL CENTERS FROM DECARBONIZATION

A. Business Benefits

Hospitals face significant cost pressures, no matter whether they are funded as a non-profit, by the government, or through investors.⁵⁷ Given the unavoidable role of financial pressure in hospital management, cost reduction can be a powerful motivator to decarbonize.⁵⁸

Interestingly, organizations need not even take active steps to decarbonize to see cost-saving benefits—calculating a carbon footprint can identify cost savings measures on its own. Wal-mart found that it could reduce its carbon footprint by selling more concentrated detergent in smaller bottles, which reduced its shipping costs and led to savings.⁵⁹ Walker's Crisps, a major potato chip brand based in the United Kingdom, similarly found cost savings by evaluating its carbon emissions. Walker's had been purchasing potatoes by the pound, therefore

⁵⁴ Matthew J. Eckelman et al., *Health Care Pollution And Public Health Damage In The United States: An Update*, 39 HEALTH AFFS. 2071 (2020).

⁵⁵ *Id.*

⁵⁶ See *infra* Section III.A.

⁵⁷ *Hospitals and Health Systems Face Unprecedented Financial Pressures Due to COVID-19*, AM. HOSP. ASS'N. (May 2020), <https://www.aha.org/guidesreports/2020-05-05-hospitals-and-health-systems-face-unprecedented-financial-pressures-due>.

⁵⁸ Michael Vandenberg, *The Drivers of Corporate Climate Mitigation* (Vand. Univ. L. Sch. Legal Stud. Rsch. Paper Series, Working Paper No. 17-69, 2018) (describing the role of cost savings as a motivator in corporate decisions to embrace decarbonization).

⁵⁹ MICHAEL P. VANDENBERGH & JONATHAN GILLIGAN, *BEYOND POLITICS: THE PRIVATE GOVERNANCE RESPONSE TO CLIMATE CHANGE* 198 (Cambridge 2017).

incentivizing farmers to keep their potatoes wet while being warehoused and shipped to increase nominal weight.⁶⁰ This led to the loss of potatoes and higher transport costs.⁶¹ Walker identified this inefficiency while mapping its carbon emissions and reduced both its GHG output and waste and costs in its potato supply simply by changing the metric it used to price potatoes.⁶²

Healthcare systems may be skeptical that similar disclosure or “mapping” efforts would benefit them. Their products are much more complex than a potato chip or detergent pack. However, Cleveland Clinic and other hospitals have shown significant cost savings in hospital decarbonization. A 2017 article found that Cleveland Clinic saved \$30 million in materials purchases and \$50 million in energy costs in the first ten years of its “systemwide sustainability drive.”⁶³ Cleveland Clinic’s “LED Retrofit”, which replaced fluorescent light bulbs with LEDs throughout the hospital, reduced the system’s electricity consumption by 28.6 million kilowatts per year.⁶⁴ The lower electricity consumption in lightbulbs alone saves Cleveland Clinic \$2 million per year,⁶⁵ and a change in the hospital’s ventilation system results in another \$3 million in annual savings.⁶⁶ Similarly, Boston Medical Center, which “lowered its energy use by nearly 40 percent and reduced its greenhouse gas emissions from all sources by 90 percent while caring

⁶⁰ Timo Elliott, *Carbon Footprint Analysis Leads to Concrete Savings: Walkers Crisps*, DIGITAL BUS. & BUS. ANALYTICS (June 22, 2011), <https://timoelliott.com/blog/2011/06/carbon-footprint-analysis-leads-to-concrete-savings-walkers-crisps.html>.

⁶¹ *Id.*

⁶² *Id.*

⁶³ Jeff Ferenc, *Cleveland Clinic Makes Carbon-Neutrality its Newest Sustainability Goal*, ASHE HEALTH FACILITIES (Nov. 30, 2017), <https://www.hfmmagazine.com/articles/3210-cleveland-clinic-makes-carbon-neutrality-its-newest-sustainability-goal>.

⁶⁴ Alice Chen & Vivek Murthy, *How Health Systems are Meeting the Challenge of Climate Change*, HARVARD BUS. REV. (Sept. 18, 2019), <https://hbr.org/2019/09/how-health-systems-are-meeting-the-challenge-of-climate-change> (noting that the LED change also improved light quality and reduced employee time devoted to changing lightbulbs, given that LEDs burn out less quickly than fluorescents.).

⁶⁵ *Id.*

⁶⁶ *Id.* The ventilation change—here, installing a new system—enabled Cleveland Clinic to filter and exchange air based on a room’s use, as opposed to doing so constantly. Hospitals must exchange air regularly when rooms are in use to prevent infection risk, but inefficiencies in systems can result in air exchanges with no medical benefit but high costs. *Id.*

for more patients” through the adoption of environmental initiatives, notes that sustainability initiatives saved its system “significant amounts of money.”⁶⁷

Even if a hospital system lacks the up-front capital to convert systems, small changes taken in aggregate can add up to tremendous cost and energy savings. For example, Cleveland Clinic’s energy efforts saved \$400,000 per year by installing software that automatically puts computers to sleep when not in use,⁶⁸ \$400,000 by adjusting its lighting systems to shut off in unoccupied areas,⁶⁹ and \$600,000 by lowering its average room temperatures by two degrees Fahrenheit.⁷⁰

Practice Greenhealth, a non-profit that provides healthcare systems with resources on decarbonization and waste reduction, advises its members that, on a per Operating Room per year basis, reduction in the use of anesthetic gas can save \$2,593, fluid management systems can save \$3,389, reusable sterilization containers can save \$1,742, and medical device reprocessing can save \$6,206, among other small but powerful savings metrics.⁷¹ Given that OR’s “drive up to 60% of a hospital’s revenue, are responsible for 40 to 60% of an organization’s total supply costs, produce more than 30% of a facility’s waste and two-thirds of its regulated medical waste, and can consume more than three to six times more energy per square foot than anywhere else in the facility,” focusing on ORs as the first step in decarbonization has a high potential for both cost and environmental impact.

⁶⁷ Schlossberg, *supra* note 25. In addition to a chilled-loop cooling system and cogeneration plant, the NY Times reports that Boston Medical Center has started a rooftop garden that “grows about 6,000 pounds of food a year for its food pantry, inpatient meals and a hospital-based farmers market,” as well as a “biodigester that converts food waste into water.” *Id.*

⁶⁸ Laura Ramos Hegwer, *How Cleveland Clinic Saved Millions Through Smarter Energy Use*, HEALTHCARE FIN. MGMT. ASS’N (Jan. 31, 2018), <https://www.hfma.org/topics/article/59381.html>.

⁶⁹ *Id.*

⁷⁰ *Id.* The hospital noted that the difference in heating and cooling did not affect patient or provider comfort. *Id.*

⁷¹ *Greening the OR*, PRACTICE GREENHEALTH, <https://practicegreenhealth.org/topics/greening-operating-room/greening-or> (last visited Oct. 30, 2022).

B. Reputational and Employee Retention Benefits

Recruitment and retention of employees may serve as another motivator for medical center decarbonization.⁷² The market for health professionals is highly competitive, especially after the trials of COVID-19.⁷³ While it may not be a determinative factor, positive perceptions around climate change mitigation may provide competitive advantages in staff retention and recruitment, particularly for entry-level positions.

Millennials and Generation Z are more concerned about climate change than previous generations. 87 percent of Millennials are concerned about climate change⁷⁴ and 41 percent of 18-25 year olds consider climate change one of the most important issues facing the world—a stronger consensus than any other single issue.⁷⁵ This concern influences employment decisions—40 percent of millennials have stated they would choose a job because the company was more environmentally sustainable and 70 percent would choose to work for a company with a robust environmental agenda.⁷⁶ The medical industry is not immune from these sentiments.

⁷² VANDENBERGH & GILLIGAN, *supra* note 59, at 185 (“In addition to efficiency opportunities, direct consumer demand and reputational concerns, corporations may participate in private climate initiatives in an effort to improve the recruitment, motivation, and retention of employees. Empirical support for this proposition is thin, but some evidence suggests that a firm’s green reputation affects these important workforce issues.”).

⁷³ *7 Steps for Hospitals to Recruit Specialists in a Competitive Market*, BECKER’S HOSP. REV. (Nov. 11, 2011), https://www.beckershospitalreview.com/hospital-key-specialties/7-steps-for-hospitals-to-recruit-specialists-in-a-competitive-market.html?oly_enc_id=3181D6227656B6X (“The market for recruiting physicians to hospitals has become competitive due to the shortage of physicians and the push to align with physicians for accountable care organizations, patient-centered care homes and other collaborative models.”).

⁷⁴ P. FERY, M. SPEISER, C. LAKE, & J. VOSS, ECOAMERICA & LAKE RSCH. PARTNERS, AMERICAN CLIMATE METRICS SURVEY: MARCH 2018 1 (2018). Compare this to 77 percent of 40-49 year olds and 59 percent of those 65 and older. *Id.*

⁷⁵ *Climate Change Ranks Highest as Vital Issue of Our Time – Generation Z Survey*, AMNESTY INT’L (Dec. 10, 2019), <https://www.amnesty.org/en/latest/news/2019/12/climate-change-ranks-highest-as-vital-issue-of-our-time/>. This study is based on a survey conducted in 2019, which sent questionnaires to 10,000 18-25 year olds in 22 countries. *Id.*

⁷⁶ *Millennials Really Do Want To Work for Environmentally-Sustainable Companies, According to a New Survey of Large Company Employees*, GOVERNANCE & ACCOUNTABILITY INST., INC. (Feb. 23, 2019), <https://www.ga-institute.com/newsletter/press-release/article/millennials-really-do-want-to-work-for-environmentally-sustainable-companies-according-to-a-new-su.html>. To address one potential counterargument here, this effect is not limited to those in “creative” or particularly eco-friendly roles traditionally associated with environmental impact. The survey from which

Studies suggest that healthcare professionals are even more concerned about the environmental impact of their work. A 2018 Yale University Survey found that 94 percent of medical, nursing, and physician’s assistant students were “concerned about the health impacts of climate change,”⁷⁷ nearly ten points higher than the 84% of millennials generally feeling the same.⁷⁸ 90 percent of medical, nursing, and physician’s assistant students believe that medical professionals have a responsibility to mitigate pollution in their practice, and 77 percent are concerned about pollution from the healthcare industry.⁷⁹

Entry-level recruiting is one of many areas where hospital conservation efforts could increase employee retention. Medical professionals overwhelmingly support climate change mitigation in their practices. A 2015 survey by the American Thoracic Society found that 80 percent of responding members (n = 915) felt that physicians should encourage medical facilities to be environmentally sustainable.⁸⁰ The National Medical Associations 2014 survey of African-American doctors (n = 284) found that 81 percent held the same belief.⁸¹ Climate advocacy groups have found fertile ground in the medical profession. For example, Health Care Without Harm⁸² and its constituent organization, Global Green and Healthy Hospitals⁸³ have over 1,600 member organizations in 70 countries.⁸⁴ Medical student organizations such as Planetary Health Report Card and Medical Students for a Sustainable Future are pushing for classes on the health impacts of global warming.⁸⁵ Nurses have also emerged as active leaders. The Alliance of

this data was generated studied employees at primarily large, often Fortune-500 companies in the U.S.. *Id.*

⁷⁷ Emma C. Ryan, Robert Dubrow, & Jodi D. Sherman, *Medical, Nursing, And Physician Assistant Student Knowledge And Attitudes Toward Climate Change, Pollution, And Resource Conservation In Health Care*, BMC MED. EDUC., June 2022, at 3.

⁷⁸ *Id.*

⁷⁹ Ryan, Dubrow, & Sherman, *supra* note 77, at 3.

⁸⁰ Mona Safarty et al., American Thoracic Society Member Survey on Climate Change and Health, 12 ANNALS OF THE AM. THORACIC SOC. 274 (2015).

⁸¹ Mona Safarty et al., *A Survey of African American Physicians on the Health Effects of Climate Change*, 11 INT’L. J. ENVIRON. RES. PUB. HEALTH 12473 (2014).

⁸² *Leading the Global Movement for Environmentally Responsible Healthcare*, HEALTHCARE WITHOUT HARM, <https://noharm.org/> (last visited Oct. 30, 2022).

⁸³ *Acting Together for Environmental Health*, GLOB. GREEN & HEALTHY HOSPS., <https://greenhospitals.org/> (last visited October 30, 2022).

⁸⁴ *Id.*

⁸⁵ Ariel Wittenberg, *Medical Students Push for Classes on Warming’s Health Impacts*, GREENWIRE (July 7, 2021), <https://www.eenews.net/articles/medical-students-push-for-classes-on-warmings-health-impacts/>.

Nurses for a Healthy Environment created the Nurses Climate Challenge, a campaign to educate health professionals about the human impacts of climate change, and the Nurses Drawdown Initiative, which aims to draw attention to five actionable areas: clean energy, food systems and cooking practices, transportation and mobility, gender equity, and nature-based solutions.⁸⁶

IV. BARRIERS TO MEDICAL CENTER DECARBONIZATION

Climate change can be viewed as a “commons problem.”⁸⁷ Each of us will be affected by its impacts, but many individuals and organizations lack obvious incentives to reduce their own carbon emissions.⁸⁸ Beyond this overarching concern, hospitals—especially those with fewer resources or in politically polarized areas—face specific disincentives to climate action. These disincentives can be grouped into three main categories: regulatory or legislative pressure, business concerns or financial worries, and political and social pressures within the hospital's locale.

A. Regulatory Pressures on Medical Centers

Hospitals are highly controlled and regulated facilities. Their internal environments, waste streams, and emergency response preparedness are all subject to strict statutory and regulatory demands.⁸⁹ These laws and regulations aim to ensure proper standards of care within the hospital and limit these facilities' environmental impact. Hospital regulations, though important for standardization of medical care, often contain inflexible provisions which impede hospital systems' flexibility on policy issues. Strict regulatory and statutory demands can stymie the integration of environmental and community health considerations. Take, for example, medical waste disposal and emergency preparedness requirements.

1. *Medical Waste*

The Environmental Protection Agency (EPA) defines medical waste as a “subset of wastes generated at healthcare facilities.”⁹⁰ This waste is usually viewed as infectious since it

⁸⁶ Jay Lemery et. al, *supra* note 8, at 2192.

⁸⁷ See generally Elinor Ostrom, *Institutions and Common-Pool Resources*, 4 J. OF THEORETICAL POL. 243 (1992).

⁸⁸ Jonathan M. Gilligan & Michael P. Vandenbergh, *Beyond Wickedness: Managing Complex Systems and Climate Change*, 73 VAND. L. REV. 1777, 1785 (2020)

⁸⁹ See e.g. *infra* Sections 4.A.1-4.A.2.

⁹⁰ *Medical Waste*, EPA (last visited Oct. 29, 2022) <https://www.epa.gov/rcra/medical-waste>.

contains “blood, bodily fluids, and other infectious materials.”⁹¹ The improper management and disposal of this material can pose health and environmental concerns, which is why state and regulatory agencies such as the EPA enforce strict guidelines.⁹² For the EPA, the Clean Air Act (CAA), specifically section 129, dictates how and when to revise emission standards for medical waste incinerators.⁹³ Multiple laws and regulations address incineration of medical waste since 49-60 percent of medical waste is incinerated in the United States.⁹⁴ Section 129 of the CAA requires four broad actions of facilities with medical waste incinerators: establish emission limits of certain chemicals, incorporate facility siting requirements, enhance operator training and certification, and impose standards from maximum achievable control technology (MACT) on new and existing incinerators.⁹⁵ These obligations outlined in a 1990 amendment forced hospitals to incorporate modern technologies addressing toxic chemical emissions.⁹⁶

Healthcare centers must also abide by the Resource Conservation and Recovery Act (RCRA). RCRA enables the EPA to monitor and control all portions of the hazardous waste lifecycle: generation, transportation, treatment, storage, and disposal.⁹⁷ Performance, design, and operating measures must be created by the EPA under RCRA in order to regulate hazardous waste treatment and storage facilities.^{98,99} This requirement aims to prevent the release of chemicals such as organics, particulate matter, and fugitive emissions.¹⁰⁰ RCRA also places responsibilities at the state level by making states adopt regulations at least as stringent as the

⁹¹ OVERVIEW, 46 TEX. PRAC., ENVIRONMENTAL LAW § 22:1 (2d ed.)

⁹² *Medical Waste*, EPA (last visited Oct. 29, 2022), <https://www.epa.gov/rcra/medical-waste>.

⁹³ *Revised Emission Limits for Medical Waste Incinerators Re-Proposed*, 19 Air Pollution Consultant 2.25 (2009).

⁹⁴ Yingying Qi, et al., *A Novel Treatment Method of PVC-Medical Waste by Near-Critical Methanol: Dechlorination and Additives Recovery*, 80 WASTE MGMT. 1 (2018).

⁹⁵ See generally Andrea Wiseniewski, Matt Zimmerman, Tyrone Crews, Jr. Alex Haulbrook, David C. Fitzgerald, & Joseph J. Sistino, *Reducing the Impact of Perfusion Medical Waste on the Environment*, 52 J. EXTRACORPOREAL TECH. 135 (2020) (exploring the dilemmas posed by waste from perfusion circuits and proposing future reuse and recycling opportunities).

⁹⁶ See National Research Council (US) Committee on Health Effects of Waste Incineration, *Regulation Related to Waste Incineration*, in WASTE INCINERATION & PUBLIC HEALTH 6-12 (Nat'l Acads. Press 2000) [hereinafter Health Effects of Waste Incineration].

⁹⁷ See *Health Effects of Waste Incineration*, *supra* note 96, at 10.

⁹⁸ Kamrin T. MacKnight, *The Problems of Medical and Infectious Waste*, 23 ENVTL. L. 785 (1993)

⁹⁹ See *Health Effects of Waste Incineration*, *supra* note 96, at 11.

¹⁰⁰ *Id.*

EPA's rule.¹⁰¹ This, however, does not stop states from developing stricter regulations than the EPA. RCRA's Subpart O enhanced design and operation regulations by requiring new protocols that impacted all stages of hazardous waste incineration.¹⁰² Waste-feed management, sampling, and analysis were obligated to determine what chemicals would be in the emissions.¹⁰³ Operational protocols were either enhanced, such as stricter recordkeeping and reporting, or newly implemented, such as equipment inspection and contingency plans.¹⁰⁴ Finally, RCRA established financial penalties if facilities were determined not to comply with Subpart O.¹⁰⁵

While these requirements are an essential element of public environmental law, they also restrict healthcare centers' options for decarbonization. Incineration is an energy-intense activity, but the strict regulation of medical waste makes it difficult for healthcare centers to use alternative disposal methods and incentivizes erring on the side of waste when materials are potentially compromised.

2. *Emergency Preparedness - Medicare and Medicaid Requirements*

Emergency preparedness protocols encompass multiple required steps that Medicare- and Medicaid-participating facilities must implement according to the 2016 final Centers for Medicare and Medicaid Services (CMS) rule.¹⁰⁶ This rule sought to coordinate healthcare facilities at all levels to comply with national emergency preparedness requirements necessary to respond to natural and man-made disasters.¹⁰⁷ Conformity with CMS's final rule requires the following provisions in four categories: risk assessment and planning, policies and procedures, communication plan, and training and testing.¹⁰⁸

¹⁰¹ *Id.*

¹⁰² *See* Health Effects of Waste Incineration, *supra* note 96, at 6-9.

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ 81 C.F.R. § 63859.

¹⁰⁷ *Emergency Preparedness Rule*, CTRS. FOR MEDICARE & MEDICAID SERVS. (last visited Oct. 29, 2022)

<https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertEmergPrep/Emergency-Prep-Rule>.

¹⁰⁸ *Id.*

An all-hazards approach is a holistic, integrated method that measures the capacities and capabilities of hospitals to respond to an array of disasters.¹⁰⁹ This approach requires a location-specific lens so that healthcare facilities acknowledge the hazards and disasters that are more likely to occur.¹¹⁰ The all-hazards approach is required for all emergency preparedness steps mandated by the CMS before the establishment of an actual emergency plan since the all-hazards assessment is a necessary part of the final plan.¹¹¹

Hospitals are required to have standby and emergency power systems.¹¹² These emergency systems, primarily back-up generators, have specific requirements that healthcare facilities must follow. First, the location of the generator must comply with the Health Care Facilities Code and Life Safety Code.¹¹³ These codes contain provisions from the National Fire Protection Association (NFPA) and Tentative Interim Amendments (TIA), which are codes that have yet to undergo the entire standards-making procedure for NFPA codes.¹¹⁴ The primary NFPA standard is NFPA 110, which requires back-up systems to contain “power sources, transfer equipment, controls, supervisory equipment, and accessory equipment needed to supply electrical power to the selected circuits.”¹¹⁵ Testing and inspection must be performed on emergency power generators under the Health Care Facilities, Life Safety, and NFPA codes.¹¹⁶ Lastly, for hospitals who keep on-site fuel sources, hospitals must develop plans on how the fuel will keep standby power sources running during an emergency.¹¹⁷

¹⁰⁹ STATE OPERATIONS MANUAL: APPENDIX Z-EMERGENCY PREPAREDNESS FOR ALL PROVIDER AND CERTIFIED SUPPLIER TYPES, CTRS. FOR MEDICARE & MEDICAID SERVS. (Mar. 4, 2019),

https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/som107ap_z_emergprep.pdf [hereinafter SOM].

¹¹⁰ *Id.*

¹¹¹ 81 C.F.R. § 63859.

¹¹² *Id.* at § 482.15(e).

¹¹³ *Id.* at § 481.15(e)(1).

¹¹⁴ *Id.* See also, e.g., *Standard on Recreational Vehicles*, NAT’L FIRE PROT. ASSN. (2005)

<https://www.nfpa.org/assets/files/AboutTheCodes/1192/TIA1192-05-1.pdf>

¹¹⁵ *Standard for Emergency and Standby Power Systems*, NAT’L FIRE PROT. ASS’N (last visited Oct. 29, 2022),

<https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=110>.

¹¹⁶ 81 C.F.R. § 63859 § 482.15(e)(2)

¹¹⁷ *Id.* at § 482.15(e)(3)

As previously discussed, these regulations limit hospitals' ability to decarbonize. NFPA requires the use of diesel generators, which produce not only high levels of emissions during regular test runs, but also produce other harmful emissions that can impact patient health.¹¹⁸ Understanding these limits and staying within their bounds is a challenge to hospital decarbonization and an important element of any full-scope decarbonization framework.

However, emergency preparedness requirements can also facilitate decarbonization strategies. Testing and training requirements obligate active participation among hospital staff to ensure they are knowledgeable of emergency preparedness policies and procedures.¹¹⁹ For testing and training measures to comply with CMS's rule, it must acknowledge and follow the previously discussed material: risk assessments, policy and procedures, and communication plan.¹²⁰ Hospitals do this through two required full-scale emergency plan testing exercises performed each year.¹²¹ In addition to testing measures, training programs must maintain the necessary training, demonstrate that hospital staff can adequately exercise the training, and retrain staff when procedures are updated.¹²² The biannual retraining requirement gives hospitals a venue to proliferate improvements to emergency management's environmental impact (where appropriate) and allows for resilience in the face of new or worsening climate crises.

B. Business Pressures

Access to adequate capital for the up-front costs of implementing renewable energy infrastructure "is often the primary barrier" to energy-related projects in healthcare.¹²³ These initial costs are particularly high for hospitals since healthcare facilities require a significant

¹¹⁸ See *supra* Section I.B.2.

¹¹⁹ 20 No. 7 OSHA GUIDE FOR HEALTH CARE FACILITIES NEWSL. 4.

¹²⁰ SOM, *supra* note 109 at § 482.15(d).

¹²¹ *Id.* at § 482.15(d)(2).

¹²² *Id.* at § 482.15(d)(1).

¹²³ U.S. DEP'T OF ENERGY, NAT'L RENEWABLE ENERGY LAB'Y, ADVANCED ENERGY RETROFIT GUIDE: PRACTICAL WAYS TO IMPROVE ENERGY PERFORMANCE 8 (2013), <https://www.nrel.gov/docs/fy13osti/57864.pdf>; see also DEP'T OF ENERGY, BLDG. TECHS. PROGRAM, RENEWABLES MAKE A POWERFUL CASE AS HOSPITAL ENERGY SOURCE 4 (2011), https://www1.eere.energy.gov/buildings/publications/pdfs/alliances/hea_renewables_fs.pdf ("Obtaining sufficient financing sometimes is the biggest road block to the use of renewable energy.")

amount of energy.¹²⁴ In a 2015 survey analyzing sustainable operations in healthcare, 61 percent of respondents cited competing investments and spending priorities as the top barrier to implementing environmentally sustainable infrastructure.¹²⁵

The economic stress faced by most hospitals in the wake of COVID-19 likely exacerbates the financial barriers to decarbonization in the healthcare industry.¹²⁶ A report found that more than half of all U.S. hospitals are expected to have negative margins through 2022.¹²⁷ The aftermath of the pandemic has ultimately placed a “vast majority of America’s hospitals in serious financial jeopardy.”¹²⁸ Hospital investments in green infrastructure, therefore, face a significant financial barrier given the current economic state of the industry.

C. Political Barriers

Unfortunately, decarbonization is not universally popular. While millennials of both parties increasingly see the climate crisis as an existential threat,¹²⁹ global warming remains one of the most polarized issues in our political system.¹³⁰ Scholars studying the intersection of

¹²⁴ *Is Renewable Energy A Realistic Option For Hospitals?*, LIMITLESS ENERGY, <https://www.limitlessenergy.org/blog/renewable-energy-for-hospitals/> (last accessed Oct. 30, 2022).

¹²⁵ Suzanna Hoppszallern, Beth Burmahl, & Jamie Morgan, *2015 Sustainable Operations Survey*, HEALTH FACILITIES MGMT. (Oct. 7, 2015), <https://www.hfmmagazine.com/articles/1759-2015-sustainable-operations-survey>.

¹²⁶ See Alan D. Kaye, et al., *Economic Impact of COVID-19 Pandemic on Healthcare Facilities and Systems: International Perspectives*, 35 BEST PRAC. & RSCH. CLINICAL ANAESTHESIOLOGY 293, 297–298 (2021) (discussing the impact of COVID-19 on U.S. healthcare facilities).

¹²⁷ KAUFMANHALL, THE CURRENT STATE OF HOSPITAL FINANCES: FALL 2022 UPDATE 1 (Sept. 15, 2022), https://www.kaufmanhall.com/sites/default/files/2022-09/KH-Hospital_Finances_Report-Fall2022.pdf.

¹²⁸ *Report: Hospitals Face Worst Year Financially Since Start of COVID-19 Pandemic, Jeopardizing Access to Patient Care*, AM. HOSP. ASSOC. (Sept. 15, 2022), <https://www.aha.org/news/headline/2022-09-15-report-hospitals-face-worst-year-financially-start-covid-19-pandemic>

¹²⁹ Alicia Adamczyk, *76% of Older Millennials Are Worried About Climate Change—and It’s Impacting How They Spend Their Money*, CNBC (May 28, 2021, 11:07 AM) <https://www.cnbc.com/2021/05/28/how-climate-change-is-impacting-millennials-money-decisions.html> (“[A]round 76% of older millennials think climate change poses a serious threat to society.”).

¹³⁰ THE POLITICS OF CLIMATE, PEW RSCH. CTR. (Oct. 4, 2016), <https://www.pewresearch.org/science/2016/10/04/the-politics-of-climate/>.

healthcare and the environment note that “reliance on public funds for medical education and health care delivery . . . tempers any bold action on climate and health initiatives that may run counter to extant political priorities.”¹³¹ Hospitals may also face political challenges to private environmental governance efforts to decarbonize from their local communities, board members, or legislatures. While these pressures are not insurmountable, they highlight the care with which environmental campaigners and hospital systems must implement plans to become more environmentally friendly.

Two key examples of healthcare systems’ susceptibility to political pressure arise from the COVID-19 pandemic and recent debates around transgender healthcare. In late 2021, hospitals faced pressure to prescribe ivermectin as a treatment for COVID-19 after a series of lawmakers endorsed the now-debunked treatment.¹³² Hospitals faced lawsuits,¹³³ threats of violence,¹³⁴ and, in one case, interventions from state politicians.¹³⁵ While the pressure in ivermectin cases rarely led to major programmatic changes in hospital management, the same cannot be said for pressure around transgender healthcare.

¹³¹ Lemery, et al., *supra* note 8, at 2194.

¹³² Blake Farmer, *As Constituents Clamor for Ivermectin, Republican Politicians Embrace the Cause*, KHN (Nov. 8, 2021), <https://khn.org/news/article/ivermectin-covid-treatment-republican-politicians-rally-around-cause/> (describing a series of Republican politicians endorsement of ivermectin in response to constituent pressure).

¹³³ See, e.g., Andrew Jeong, *Texas Court Says Hospitals Can’t Be Forced to Offer Ivermectin to COVID Patient on Ventilator*, WASH. POST. (Nov. 19, 2021), <https://www.washingtonpost.com/health/2021/11/19/texas-court-ivermectin-lawsuit-sue/> (Texas); Scott Gleeson, *Florida Teacher at Center of Ivermectin Lawsuit Dies of COVID; Husband Says “Name a Law After Her,”* USA TODAY (Nov. 17, 2021), <https://www.usatoday.com/story/news/health/2021/11/17/florida-teacher-center-ivermectin-lawsuit-dies-covid-19/8648543002/> (Florida), Joel Keilman, *Libertyville Hospital That Was Ordered to Let COVID-19 Patient Receive Ivermectin Says Controversial Medication is Putting Her at Risk*, CHI. TRIB. (Sep. 21, 2021), <https://www.chicagotribune.com/news/breaking/ct-libertyville-hospital-covid-lawsuit-patient-ivermectin-20210922-g7tjh2sm3fdablpbzomuv26vvu-story.html> (Illinois).

¹³⁴ Matt Volz, *Hospitals Refused to Give Patients Ivermectin. Lockdowns and Political Pressure Followed*, KHN (Dec. 2, 2021), <https://khn.org/news/article/ivermectin-covid-treatment-hospital-threats-political-pressure/> (describing incidents of threatened violence in Montana and Idaho).

¹³⁵ *Id.* (describing a three-minute voicemail from the Montana State Attorney General to a Hospital in Helena after the hospital refused to prescribe ivermectin).

In 2022, UCLA School of Law’s Williams Institute reported that 15 states have restricted access to gender-affirming care or are considering laws that would do so.¹³⁶ Even where State government has not directly regulated transgender healthcare, clinics involved in transgender healthcare have limited offerings or shut down entirely in response to political pressure.¹³⁷ More recently, Vanderbilt University Medical Center itself paused gender-affirming surgeries for patients under the age of 18 after tweets by a conservative blogger led Tennessee lawmakers to push for investigations into the hospital.¹³⁸

Environmental efforts are not likely to see the same harsh protests or direct political action that transgender healthcare or COVID-19 have. For one, decarbonization of healthcare systems is not directly related to patient care decisions in the same way that more sharply criticized issues are. Instead, most decarbonization interventions impact hospitals’ business practices and infrastructure.¹³⁹ Secondly, decarbonization efforts by individual businesses have not faced the same intensity of rhetoric as transgender healthcare or ivermectin use. While there has been political opposition to investment groups restricting their funding to those in

¹³⁶ Kerith J. Conron, Kateryn K. O’Neill, Luis A. Vasquez, & Christy Mallory, *Prohibiting Gender-Affirming Medical Care for Youth*, UCLA SCH. L. WILLIAMS INST. (Mar. 2022), <https://williamsinstitute.law.ucla.edu/publications/bans-trans-youth-health-care/>.

¹³⁷ Orion Rummier, *Political Pressure led to Shutdown of Texas’ Largest Gender-Affirming Care Program*, TEX. TRIB. (Mar. 11, 2022), <https://www.texastribune.org/2022/03/11/texas-genecis-closure-transgender/>.

¹³⁸ Sam Stockard & Anita Wadhwani, *Republican Lawmakers Plan to Strip Vanderbilt Hospital of Child Transgender Surgeries*, TENN. LOOKOUT (Sept. 21, 2022), <https://tennesseelookout.com/2022/09/21/republican-lawmakers-plan-to-strip-vanderbilt-hospital-of-child-transgender-surgeries/>; Andy Rose, *Vanderbilt Transgender Health Clinic Suspendds Gender-Affirming Surgery for Minors*, CNN (Oct. 9, 2022), <https://www.cnn.com/2022/10/09/us/vanderbilt-suspends-gender-affirming-surgery-minors>.

¹³⁹ See *Infra* Section III.A.

compliance with decarbonization goals,¹⁴⁰ major corporations have embraced decarbonization with little to no pushback from either end of the political spectrum.¹⁴¹

To limit the risk of political backlash, it may be wise for hospital systems to tailor the language used to refer to programs. While “ESG Plans” have become short-hand for some private environmental governance efforts, it is not the most accurate label for medical center environmental initiatives.¹⁴² It is therefore likely advisable to use different terminology that more

¹⁴⁰ See, e.g., Ken Paxton, *Paxton Launches Investigation into S&P Global’s Use of ESG Factors on Credit Ratings, Potentially Violating Consumer Protection Laws*, TEX. ATT’Y GEN. (Sep. 28, 2022)

<https://www.texasattorneygeneral.gov/news/releases/paxton-launches-investigation-sp-globals-us-e-esg-factors-credit-ratings-potentially-violating>; Marlo Oaks, *Why I Oppose ESG: Use Politics, Free Markets to Decide Policy, Not Coercion*, FOXBUSINESS OP. (Aug. 22, 2022),

<https://www.foxbusiness.com/energy/oppose-esg-politics-free-markets-not-coercion> (discussing conservative critiques of ESG); Charles Creitz, *DeSantis Announces Plan to Combat ESG Influence in Florida*, FOX NEWS (July 27, 2022)

<https://www.foxnews.com/media/desantis-announces-plan-combat-esg-influence-florida-invest> (describing Florida Governor Ron DeSantis’ “flat ban” against incorporating ESG considerations into Florida State Pension System Investments).

¹⁴¹ See, e.g., *How We’re Helping Change the World*, ABINBEV (last visited Oct. 29, 2022), <https://www.ab-inbev.com/sustainability/>. ABInBev is the global parent company of Anheuser Busch US, which produces beers such as Bud Light, Michelob, Stella Artois, Busch, and Natural Light. *Our Beeers*, ABINBEV (last visited Oct. 29, 2022), <https://www.ab-inbev.com/our-brands/>. Anheuser Busch itself has committed to 100% renewable energy by 2025, and circular packaging, among other sustainability goals. *A More Sustainable Future*, Anheuser-Busch (last visited Oct. 29, 2022). While Budweiser faced calls for a boycott over an advertisement chronicling the journey of its immigrant founder in the midst of President Trump’s call to ban immigrants from seven Muslim Majority countries, it still remains popular with conservative-identified drinkers. Trib. News Servs., *Donald Trump Supporters Call for Budweiser Boycott Over Pro-Immigration Ad*, CHI. TRIB. (Feb. 6, 2017 9:08 AM), <https://www.chicagotribune.com/business/ct-trump-supporters-budweiser-boycott-20170206-story.html>; Bryan Roth, *Look Both Ways—Where Political Backgrounds and Beer Choices Intertwine*, CRITICAL DRINKING (Nov. 5, 2018), <https://www.goodbeerhunting.com/blog/2018/11/5/look-both-ways-where-political-backgrounds-and-beer-choices-intertwine>.

¹⁴² See, e.g., *Our ESG Plan*, BOMBARDIER (last visited Oct. 19, 2022), <https://bombardier.com/en/sustainability/our-esg-plan>. Bombardier uses ESG as an umbrella category for its commitment “to a sustainable and financially resilient future,” inclusive of efforts to reduce environmental impact and improve the responsibility of its supply chain, but also of data privacy efforts, ethics and compliance/board governance generally, and employee engagement/customer satisfaction metrics which do not have direct bearing on environmental concerns. *Id.*

narrowly defines the initiative and avoids fraught political debates: “decarbonization plans,” “energy plans,” or “sustainability plans” all fit the bill.

V. SELECTED AVENUES TO MEDICAL CENTER DECARBONIZATION

There are various avenues to medical center and healthcare system decarbonization. As discussed in Section IV.A, many hospitals have found significant cost savings and decarbonization potential realizing energy efficiency and co-generation initiatives. At the other end of the spectrum, scholars and practitioners have proposed increased investment in preventive and primary care to improve healthcare’s footprint.¹⁴³ In the following section, we focus on three low-friction strategies hospitals can undertake with limited up-front investment to assist in decarbonization.

A. Reduction in Unnecessary Diagnostic Imaging

Diagnostic imaging is one of the most energy-intensive patient care activities—estimates suggest that radiography departments produce up to 9 percent of hospital emissions.¹⁴⁴ One study of Australian hospital systems found that mean CO₂e emissions were 17.5 kg for each MRI performed, 9.2 kg for each CT, and 0.8 kg per chest x-ray.¹⁴⁵ Unfortunately, studies indicate that a significant portion of radiography is performed unnecessarily.¹⁴⁶ Reducing the use of inappropriate or non-indicated diagnostic imaging has the potential to reduce these emissions significantly.

In addition to their carbon intensity, unnecessary exposure to radiation from radiography can have harmful health effects on patients. Radiation exposure can increase cancer risks to patients.¹⁴⁷ While the harms outweigh the risks when tests are necessary, misuse or overuse of

¹⁴³ See Jameton, *supra* note 5. For discussion on the ways primary health providers can prepare for and assist underserved populations, see also Carol Ziegler, Vincent Morelli & Omotayo Fawibe, *Climate Change and Underserved Communities*, 44 PRIMARY CARE: CLINICS OFF. PRACT. 171 (2016).

¹⁴⁴ Scott McAlister, Forbes McGain, Matilde Breeth-Petersen, David Story, Kate Charlesworth, Glenn Ison, & Alexandra Barratt, *The Carbon Footprint of Hospital Diagnostic Imaging in Australia*, 24 LANCET REG. HEALTH–WEST. PAC. 100459, *2 (May 3, 2022).

¹⁴⁵ *Id.* at *6.

¹⁴⁶ See, e.g., Harriet Hiscock, Rachel Jane Neely, Hayley Warren, Jason Soon & Andrew Georgiou, *Reducing Unnecessary Imaging and Pathology Tests: A Systematic Overview*, 141 PEDIATRICS 2862 (2018).

¹⁴⁷ David Kendall & Elizabeth Quill, *Reduce Unnecessary Radiological Exams*, THIRD WAY (Jan. 21, 2014)

radiography “needlessly increase[s] a patient’s radiation exposure.”¹⁴⁸ For this reason, pediatric centers advise eliminating unnecessary radiography or limiting scans to the smallest possible area.¹⁴⁹ Despite these disincentives, more than 50 percent of the abdominal CT scans may be unnecessary.¹⁵⁰ There are a variety of motivators for overtesting: fear of malpractice suits, patient expectations, financial benefit, and a good-faith abundance of caution can all motivate practitioners to order unnecessary tests.¹⁵¹

By shifting incentives for doctors ordering tests, healthcare systems have the opportunity to engage in energy cost savings, emissions reductions, and lifetime patient health improvements without compromising patient care. A 2018 study suggested that hospital policy interventions included audit and feedback mechanisms, system-based changes, and education.¹⁵² Other commentators have suggested enhancing compliance by requiring the use of decision-support tools and pre-authorization to encourage caregivers to follow science-based guidelines from medical societies.¹⁵³ Pre-authorization, which forces practitioners to more tightly comply with insurance guidelines (and therefore only order indicated radiographs) is an especially powerful compliance tool. These private governance tools would require little to no upfront cost for healthcare systems.

<https://www.thirdway.org/report/reduce-unnecessary-radiological-exams#:~:text=17-,What%20Can%20Fix%20It%3F,the%20exam%20before%20performing%20it.>

¹⁴⁸ *Id.*

¹⁴⁹ *Reducing Radiation Exposure for Kids Without Reducing Quality*, C.S. MOTT CHILDREN’S HOSP. (last visited Oct. 29, 2022), <https://www.mottchildren.org/conditions-treatments/ped-radiology/limiting-radiation-exposure-for-kids> (“We limit the region of the body being scanned/x-rayed to the smallest possible area” and “[w]e’ve eliminated unnecessary exams”).

¹⁵⁰ Kendall & Quill, *supra* note 147 (citing Kristie M. Quite, Louis Hinshaw, et al., *Ionizing Radiation in Abdominal CT: Unindicated Multiphase Scans are Important Source of Medically Unnecessary Exposure*, 8 J. AM. COLL. OF RADIOLOGY 756 (Aug. 11, 2011)).

¹⁵¹ *Id.*

¹⁵² See Hiscock et al., *supra* note 146.

¹⁵³ Kendall & Quill, *supra* note 147. (“Pre-authorization means that physicians ordering exams request that Medicare or a health insurance plan approve payment for the exam before performing it. The physician typically contacts a radiology benefit manager to ensure that the testing approach meets clinically approved guidelines established by the American College of Radiology and other medical societies.”).

B. Increasing the Availability and Use of Telehealth

Increasing the practice and availability of telehealth services could significantly reduce the emissions associated with healthcare services, especially when coupled with investment in primary care.¹⁵⁴ Studies unanimously find that telehealth reduces the carbon footprint of healthcare.¹⁵⁵ This reduction in emissions primarily results from the corresponding reduction in transportation emissions associated with patient travel to and from healthcare facilities.¹⁵⁶ A study conducted by Kaiser Permanente examined six years of data, from 2015 to 2020, and found that increased telehealth visits during the COVID pandemic directly corresponded with a dramatic drop in greenhouse gas emissions.¹⁵⁷ The Kaiser Permanente study developed an ambulatory visit carbon intensity metric to measure the total emissions associated with an outpatient visit to a healthcare facility.¹⁵⁸ Ambulatory carbon intensity emissions rose 6 percent between 2015 and 2019 but dropped sharply in 2020.¹⁵⁹ The table below summarizes the ambulatory carbon trend found by the Kaiser Permanente study.

¹⁵⁴ César Morcillo Serra, Ana Aroca Tanarro, Catherine Mary Cummings, Araceli Jimenez Fuertes & José Francisco Tomás Martínez, *Impact on the Reduction of CO2 Emissions Due to the Use of Telemedicine*, SCI. REPS., July 2022, at 2; Imelda Dacones, Colin Cave, Gregg L. Furie, Cory A. Ogden, Jonathan E. Slutzman, *Patient Transport Greenhouse Gas Emissions From Outpatient Care at an Integrated Health Care System in the Northwestern United States*, J. CLIMATE CHANGE HEALTH (Aug. 2021), at 3.

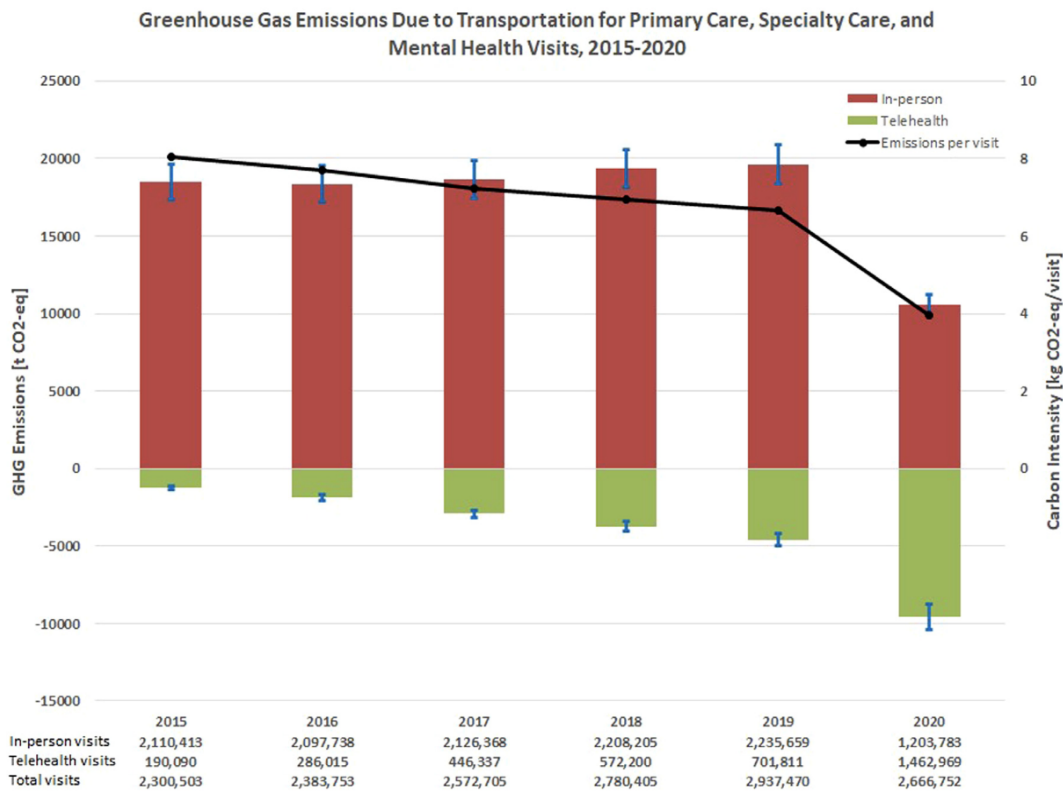
¹⁵⁵ See Amy Purohit, James Smith, & Arthur Hibble, *Does Telemedicine Reduce the Carbon Footprint of Healthcare? A Systematic Review*, 8 FUTURE HEALTHCARE J. 85, 85 (Mar. 2021).

¹⁵⁶ See Dacones, et al., *supra* note 154, at 3.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.* at 2.

¹⁵⁹ *Id.*



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The researchers correlated this dramatic decrease with the significant increase in virtual healthcare.¹⁶¹ Notably, the study found that ambulatory carbon intensity dropped by 51 percent in 2020.¹⁶² Telehealth may also allow healthcare systems to care for more patients without building new buildings for outpatient buildings.¹⁶³

Currently, telehealth technology allows healthcare providers to administer a wide range of services to patients. Telehealth services include “medical education, remote patient monitoring, patient consultation via videoconferencing, wireless health applications, and transmission of imaging and medical reports.”¹⁶⁴ Moreover, remote patient monitoring technology collects medical data from patients, including vital signs, blood pressure, weight,

¹⁶⁰ *Id.*

¹⁶¹ *Id.* at 3.

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ Shilpa N. Gajarawala and Jessica N. Pelkowski, *Telehealth Benefits and Barriers*, 17 J. NURSE PRACT. 218, 218 (2021).

blood sugar, oxygen levels, or heart rate, and transmits that data to a healthcare provider.¹⁶⁵ The telehealth model, therefore, largely mimics the traditional, in-person healthcare model.

Telehealth also provides numerous other benefits to both healthcare systems and patients.¹⁶⁶ Importantly, telehealth improves access to care by connecting patients in rural and underserved communities to healthcare providers. This is particularly true in areas with provider shortages.¹⁶⁷ Similarly, telehealth provides better support and improves health outcomes for patients with chronic conditions.¹⁶⁸ Studies show that frequent communication allows healthcare providers to provide better management for patients with chronic conditions like diabetes, hypertension, and heart failure.¹⁶⁹ Finally, telehealth reduces costs for healthcare systems by allowing providers to triage patients appropriately, therefore avoiding unnecessary visits to emergency departments.¹⁷⁰ For example, one study of a Texas hospital's telemedicine system showed "a decrease in emergency department visits up to 85% which equated to approximate savings of \$780 million over 14 years."¹⁷¹

While current technology already supports a broader adoption of telehealth, it does face some legal and regulatory hurdles.¹⁷² First, there is currently a lack of multistate licensure, which requires providers to obtain and uphold license in multiple states in order to provide care via telehealth across state lines.¹⁷³ Second, reimbursement for Medicaid largely depends on state policy, which means that coverage of certain telehealth services is dependent on state policy.¹⁷⁴

¹⁶⁵ Jeremy Sherer & Amy Joseph, *Physician Law Evolving Trends and Hot Topics: Telehealth*, 32 HEALTH L. 20, 21 (2020).

¹⁶⁶ See generally Gajarawala & Pelkowski, *supra* note 164.

¹⁶⁷ *Id.* at 218; Lois A. Ritter, *Benefits and Challenges of Telehealth in Rural Areas*, UNIV. NEV., RENO, <https://onlinedegrees.unr.edu/blog/benefits-and-challenges-of-telehealth-in-rural-areas/#:~:text=One%20of%20the%20primary%20benefits,Health%20care%20provider%20shortages> (last visited Oct. 30, 2022).

¹⁶⁸ Jeffrey A. Corbett, Janice M. Opladen, and John D. Bisognano, *Telemedicine Can Revolutionize the Treatment of Chronic Disease*, INT'L J. CARDIOLOGY & HYPERTENSION, 2020, at 2.

¹⁶⁹ *Id.*

¹⁷⁰ Dhruv Mahtta, Marilyne Daher, Michelle T. Lee, Saleem Sayani, Mehdi Shishehbor & Salim S. Virani, *Promise and Perils of Telehealth in the Current Era*, 23 CURRENT CARDIOLOGY REPS. 115, 115 (2021).

¹⁷¹ *Id.*

¹⁷² See generally Gajarawala & Pelkowski, *supra* note 164.

¹⁷³ *Id.* at 220.

¹⁷⁴ *Id.* at 221.

Finally, not all patients have access to the internet or technology required for telehealth, particularly in low-income or elderly populations.¹⁷⁵ Similarly, many patients in rural areas lack access to broadband connectivity, thus limiting access to telehealth services.¹⁷⁶

C. Procurement

As previously stated, a majority of U.S. healthcare emissions arise from its supply chain.¹⁷⁷ Many of these emissions include those created by disposable medical equipment used a single time. In a 2020 study, researchers examined the medical device supply chain and drivers of single-use disposable medical devices—such as stethoscopes, blood pressure cuffs, and complex surgical instruments.¹⁷⁸ The study concluded that reliance on single-use devices is a large part of the reason the vast majority of health sector emissions stem from its supply chain. The study describes the medical device supply chain as linear rather than circular. Whereas a circular economy maintains “manufactured products in circulation, distributing resource and environmental costs over time and with repeated use”, a linear supply chain allows for manufactured products to be used once and discarded. The authors posit that the healthcare industry’s linear supply chain contributes to excessive pollution and public health damage.¹⁷⁹

¹⁷⁵ Victoria Bailey, *Limited Broadband Poses Significant Barrier to Telehealth Access*, MHEALTH INTEL. (Aug. 6, 2021), <https://mhealthintelligence.com/news/limited-broadband-poses-a-significant-barrier-to-telehealth-access>.

¹⁷⁶ In a survey by the Bipartisan Policy Center, more than one third of rural residents cited access to broadband and computers as barriers to using telehealth. JAZYMYNE SUTTON, BIPARTISAN POL’Y CTR., *TELEHEALTH VISIT USE AMONG U.S. ADULTS 4* (Aug. 2021), https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2021/08/SSRS-Telehealth-Report_confidential_FINAL_08.02.21-1.pdf.

¹⁷⁷ Approximately 50% of healthcare emissions come arise from pharmaceuticals and procurement. *See, e.g.,* Immogen Tennesen et al., *Health Care’s Response to Climate Change: A Carbon Footprint Assessment of the NHS in England*, 5 LANCET PLANETARY HEALTH 84 (2021). This number may be higher for the U.S. healthcare system, given that unlike the NHS, U.S. hospitals engage in individual procurement processes. *Healthcare Procurement Post-Pandemic: It’s Not Just About Managing Costs*, KEARNEY (Oct. 13, 2021), <https://www.kearney.com/procurement/article/-/insights/healthcare-procurement-post-pandemic-its-not-just-about-managing-costs>.

¹⁷⁸ MacNeill, et al., *supra* note 17, at 2092.

¹⁷⁹ *Id.* at 2096.

Changing healthcare’s unsustainable supply chain has become even more essential in the wake of the COVID-19 pandemic.¹⁸⁰ During times with peak hospitalization rates, nurses and doctors were forced to reuse some materials. Finding ways to use medical materials more efficiently could help with both emissions and future disruptions, including those stemming from climate-related natural disasters.

At least two major hospital systems — Kaiser Permanente and Providence Health and Services — are already working with suppliers on strategies to tamp down on emissions.¹⁸¹ Seema Wadhwa, executive director of environmental stewardship at Kaiser, said the system recently worked with its supplier for disinfecting wipes to cut waste. Normally, the wipes come in a hard-case canister with residual hazardous chemicals. The supplier now provides the wipes in containers like those that hold diaper wipes. These containers are transported more easily, create less waste and do not have the dangerous chemicals.

NGOs can step in to help encourage and create accountability for healthcare operators employing supply chain and procurement reform measures. For example, Health Care Without Harm, an advocacy organization focused on addressing climate change in health care, consults with its members to put together questions that health systems can ask suppliers, such as whether they are monitoring their emissions or have an action plan to reduce them.¹⁸²

VI. ENCOURAGING MEDICAL CENTER UPTAKE OF DECARBONIZATION INITIATIVES THROUGH BEST PRACTICE SHARING

Healthcare systems currently have profound environmental impacts.¹⁸³ While decarbonization efforts offer value to patients, local communities, staff, and hospitals’ bottom lines,¹⁸⁴ efforts to implement private environmental governance initiatives can be siloed and are

¹⁸⁰ Shira Stein, *Hospitals Confront Their Climate Achilles Heel: Supply Chains*, BLOOMBERG L. (June 7, 2022), <https://news.bloomberglaw.com/health-law-and-business/hospitals-confront-their-climate-achilles-heel-supply-chains>

¹⁸¹ *Id.*

¹⁸² *Id.*

¹⁸³ *See supra* Section I.B.

¹⁸⁴ *See supra* Section III.A.

primarily concentrated on the American coasts and Southwest. Gaps exist in the Southeast, where hospitals are more likely to face political barriers to decarbonization.¹⁸⁵

A. Proposal

If selected, our team hopes to use the prize winnings to organize a conference of healthcare practitioners, healthcare system administrators, and legal experts from Tennessee and other Southeastern states for a one-day series of presentations. By focusing panels on issues most directly felt in our region, we hope to encourage uptake of decarbonization initiatives in a region that faces high barriers to doing so. We also hope to reach audiences within the healthcare system that may face access barriers to other programming and encourage collaboration between departments, organizations, and industries. For example, an ideal panel would bring together radiologists, procurement specialists, and vendors to discuss energy savings in radiology practice and procurement. An alternate panel could bring together nurses, climate scholars, and hospital administrators to discuss the importance of primary and bedside care in patient outcomes and emissions reductions.¹⁸⁶

In order to maximize accessibility, best use program funds, and minimize our own carbon impact, our ideal conference would be via zoom.

B. Implementation

1. Implementation Schedule

If funded by the Hack competition, we would hope to host a conference in Spring 2023, ideally in early May to meet the six month reporting guideline. To maximize attendance, we would focus January and February efforts on securing speakers and negotiating honoraria, then would finalize a schedule by mid-March. Once a schedule is finalized, we would use March and April to recruit attendees.

¹⁸⁵ See, e.g., Maggie Shober & Heather Pohnan, *Tracking Decarbonization in the Southeast: TVA's Stalled Decarbonization Disadvantages the Tennessee Valley*, S. ALL. FOR CLEAN ENERGY (Oct. 9, 2020), <https://cleanenergy.org/blog/tracking-decarbonization-in-the-southeast-tvas-stalled-decarbonization-disadvantages-the-tennessee-valley/>.

¹⁸⁶ Nurses perform a critical role in patient care - several studies have indicated that the best predictor of patient outcomes is nursing workload and staffing. See Jessamyn Phillips, Alex Peck Mallaris & Debra Bakerjian, *Nursing and Patient Safety*, PSNET (Apr. 21, 2021), <https://psnet.ahrq.gov/primer/nursing-and-patient-safety>.

Our recruitment strategy would be two-pronged, and focus on reaching audiences not currently participating in existing consortiums for climate. We would first reach out to major actors in the space, including CHEEL, Practice Greenhealth, and the Lancet Commission on Climate Change's Southern Region, as well as hospitals and healthcare systems in the Tennessee area. The second recruitment prong would focus on targeted advertising through social media platforms, running targeted advertisements to segments composed of healthcare workers with interest in environmental issues.

We hope that by lowering barriers to entry seen with traditional conference formats (travel, registration costs) we will be able to attract a critical mass of attendees.

2. Use of Funds

If funded by the Hack Competition funds, we would hope to use 75% of the hack funding (\$1500) for honoraria, which we hope would be matched by other funding or grantmaking from within the Vanderbilt system. The remaining 25% of the funding would be used for recruitment and advertising costs.¹⁸⁷

Conclusion

Healthcare is a major contributor to greenhouse gas emissions, and faces unique challenges in decarbonization, many of which can only be addressed through private environmental governance. By bringing together experts and advocates at the forefront of this vital private environmental governance issue, we hope to increase momentum on decarbonization in the Southeast.

¹⁸⁷ Currently, estimates for Facebook advertising run around \$7 for 1,000 impressions and \$1 CPC (cost-per-click). *How Much Does Facebook Advertising Cost in 2022*, WEBFX (last visited Oct. 20, 2022), <https://www.webfx.com/social-media/pricing/how-much-does-facebook-advertising-cost/>.

Appendix 1: Competition Certification

We hereby certify that the brief for Vanderbilt Law School is a product of the undersigned. We further certify that the undersigned have read the Competition Rules and that this brief complies with these rules.

October 30th, 2022

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