DISCUSSION PAPER

Regulatory Agenda: Addressing Greenhouse Gas Emissions from Health Care Building Energy Use

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Overview

Since the early months of 2025, the notion that government would adopt policies to reduce the threats from climate change seems almost quaint. However, physics and chemistry do not negotiate; collective failure to bend the climate curve can only result in increased suffering for increasing numbers of people. Most policies that work to reduce climate impacts have extensive co-benefits: they create jobs, they make the air healthier to breathe, they reduce energy costs to US businesses. Many policy makers in local and state governments still care about these benefits. Importantly, most of the policies described herein for application at a national level can also be applied by state and local authorities.

In the spirit of "first, do no harm," the policy proposals advanced herein to protect the health of people and the environment—admittedly developed at a time when government seemed more attentive to the issue of climate change—still need to be advanced.

The purpose of this discussion paper is to outline a series of potential policy proposals that can be implemented at the federal, state, and municipal levels of government, as well as by non-governmental organizations, to reduce building energy Scope 1 and Scope 2 emissions from health care facilities and thus accelerate progress toward addressing the climate challenge (Greenhouse Gas Protocol, n.d.). This discussion paper does not address all Scope 1 emissions from health care organizations, such as refrigerants, inhaled anesthetics, and other sources. Thus, it should be acknowledged that this discussion paper, while addressing approximately 25 percent of overall health care emissions, leaves almost 75 percent of health care emissions unaddressed—due to Scope 3 sources, including pharmaceuticals and chemicals, medical devices and supplies, food, water, waste, and transportation. Scope 3 emissions remain a significant area to be addressed to achieve net zero emissions from the health care sector. By focusing on Scope 1 and 2 building emissions, this discussion paper attempts to accelerate progress in the area most directly in the control of health care organizations.

This discussion paper is *not* intended to be the last word on this topic. The authors anticipate future updates to this agenda as thinking and opportunities evolve. In its waning days, the Biden Administration committed the United States to achieving a 61 percent reduction in aggregate greenhouse gas (GHG) emissions by 2035, relative to a 2005 baseline. This 2035 climate target can serve as a North Star for states, cities, and corporations (Dlouhy, 2024). The strategies outlined herein will complement recently enacted policies and available funding streams.

The potential policies described in this discussion paper are not mutually exclusive. The purpose of this collection of potential policy opportunities is to offer policy makers actions they can take quickly, to help the world achieve the needed emissions reduction in a timely way. Policy makers should consider the overlap among suggested initiatives as they craft their policy agendas. In all cases, the authors have tried to describe the existing condition,

the specific policy suggestion, the feasibility of that proposed policy, and its potential impact.

This discussion paper is organized to reflect, first, some of the policy barriers and existing conditions that are preventing health care organizations from pursuing more aggressive decarbonization agendas. The second section suggests opportunities for policy interventions at the various levels of government that can catalyze the needed change, given the uncertainties in federal climate policy.

The only viable path to carbon neutrality by 2050 for the health care sector includes full-scale building electrification supported by an upgraded utility grid powered by 100 percent renewable energy. This discussion paper aims at this target in the policy suggestions that are presented.

Background

Climate change affects health and health care delivery systems. Health care organizations are dealing with the impacts daily. The US health care sector is responsible for roughly 8.5 percent of US GHG emissions and 25 percent of global health care emissions (Dzau et al., 2021; Eckelman et al., 2020). Operations and energy use in health care buildings generate approximately 25 percent of overall health care emissions, and these emissions are most directly under the control of a health care organization.

Climate change does not affect everyone equally (Ebi and Hess, 2020). In general, wealthier people consume more of everything and generate more emissions per capita than less wealthy persons. They are also better able to insulate themselves from the worst impacts of climate change. Populations of lower socioeconomic status bear the brunt of carbon and related atmospheric pollution and rising fossil fuel costs (EPA, 2021). The health of economically disadvantaged people is disproportionately impacted by poor air quality caused by nearby combustion of fossil fuels, including boilers and diesel generators (California Energy Commission, 2018).

Health care facilities in general, and acute care hospitals in particular, play a critical role in the infrastructure of the country, especially during various kinds of public health emergencies. In normal operation, they often provide shelter for the most vulnerable members of the population. Staff in these facilities are constantly exposed to a variety of infectious agents, chemicals, and processes necessary for treatment. The regulations for health care buildings, in response to these challenges, are thus unique among building types. Regulations intended to apply to buildings broadly are often mismatched with the unique requirements of health care facilities. They often conflict with other regulations imposed upon health care facilities. Thus, there is a need for health care-specific decarbonization regulation that considers these unique needs and encompasses some of the unique attributes of these buildings.

A growing number of jurisdictions are using their regulatory authority to require carbon or energy reporting as well as setting targets for building performance (ASHRAE, 2021a). However, the current approach to establishing targets and goals is inconsistent, and the prescriptive requirements in these codes frequently overlook the unique characteristics and the regulatory framework of hospitals and other health care facilities.

Amplifying the challenge for the US health care sector is the financial commitment required to make carbon-reducing investments. Further complicating the needed change is the unique role health care organizations play in every community—they must provide care 24 hours a day, 7 days a week. Health systems typically act because they are required to, or because they can reduce costs. This discussion paper outlines a set of policy prescriptions that can accelerate the decarbonization of this sector by accomplishing both.

Note that the imperatives of both climate resilience and climate protection are real, but they are not the same. In many cases, investment in resilience to the changing climate may drive solutions that *increase* emissions. Investments in

resilience are generally more attractive to actors in health care organizations because the benefits of such investments go to the people who make those investments. But, because investments in protecting the climate tend to be distant from the benefits those investments yield, they are much less attractive to individual actors. Because the beneficiaries of investments in protecting the climate are all members of society, support for such efforts is a much more important area of focus from collective entities such as the various governments that represent them.

Regardless of the financial barriers to implementing decarbonization and other highly sustainable design strategies, many health care system leaders are already deeply engaged in sustainable design and construction largely because it aligns with their humanitarian and stewardship missions and visions. They have connected their attitudes about the natural environment with the environment's effect on their patients' health. They are not primarily motivated by maintaining a pristine wilderness or promoting resource conservation for its own sake. Decarbonization and other forms of sustainable development are seen as integral to their mission to serve and steward the resources and health of the communities they serve. For them, these efforts are fundamentally connected to health and to basic human values.

The best available data on health care sector energy consumption comes from the US Department of Energy (DOE) Commercial Buildings Energy Consumption Survey (CBECS) database. CBECS released its 2018 data in December 2022. According to this data, hospitals are the third most energy intensive building type (in kBTU/sf/year) of any building type other than food service and food sales buildings, consuming, on average, 193.3 kBTU/sf/year of site energy, or 395 kBTU/sf/year of source energy (EIA, 2018a; EIA, 2018b; EIA, 2018c). This outsized energy consumption translates into significant carbon emissions (Mazzetti, 2020). There is no data available on the total amount of renewable energy produced or consumed by hospital buildings. The National Academy of Medicine's Action Collaborative on Decarbonizing the US Health Sector supports the guidance of the US Department of Health and Human Services (HHS), and the Intergovernmental Panel on Climate Change (IPCC), with a goal to reduce the climate footprint of the US health care sector by 50 percent from its current level by 2030 (National Academy of Medicine, n.d.).

The mathematics are simple, and ambitious. To reach the IPCC target, no new health care buildings that emit additional GHGs should be built, and emissions from the existing building stock must be cut in half. This reality requires health care organizations to move aggressively to all-electric buildings, and a coincident evolution of the US electrical supply infrastructure toward low- and no-emission sources (Baum et al., 2024).

Policy Barriers and Existing Challenges

Health care is among the most regulated of industries. These regulations cover all dimensions of the industry, including buildings. Such building regulations include building, energy, and life safety codes, as well as licensing and reimbursement rules.

Authorities writing, adopting, and enforcing these regulations do so in uneven, overlapping, overly formalistic, and sometimes contradictory ways across the United States (US Office of Energy Efficiency and Renewable Energy, n.d.). In some cases, such regulations impede carbon emission reduction efforts. One interesting example is the current set of requirements for ventilation contained in ASHRAE Standard 170 and adopted as code by many jurisdictions in the United States. These requirements force hospitals to over-ventilate in most instances, but seem to be immoveable (Barolin and English, 2023).

In addition, since 2022, three significant judicial decisions have complicated the process of developing regulatory requirements to advance decarbonization goals. First, in *California Restaurant Association v. City of Berkeley*, the Ninth Circuit Court of Appeals held that the City

of Berkeley was preempted by the federal Energy Policy and Conservation Act from enacting laws that prevent the combustion of fossil fuels within buildings. Second, in *West Virginia v. Environmental Protection Agency,* the US Supreme Court held that federal agencies were forbidden from implementing regulation of "vast economic and political significance" without clear statutory authority, including the Obama administration's Clean Power Plan. Finally, in *Relentless, Inc. v. Department of Commerce* and *Loper Bright Enterprises v. Raimondo,* the Supreme Court did away with the "Chevron doctrine" (the principle that required courts to defer to a federal agency's "reasonable" interpretation of a statute or regulation if the law was ambiguous or left a gap), reserving to the judiciary the complete responsibility for such decisions. These three decisions complicate the ability of the executive branch to use its agencies to implement policy. Thus, effective progress on decarbonization will require an all-of-government approach—both across branches of the federal government and through all levels of federal, state, and local governments.

Barriers and challenges include the following:

1. Many jurisdictions, including the Centers for Medicare and Medicaid Services (CMS), can be slow to adopt the latest edition of building codes that provide both opportunities and requirements for creating better health care buildings and reducing carbon emissions.
2. Most model codes do not consider carbon reduction in their development nor their requirements (until recent changes that only begin to address embodied carbon), resulting in codes that lock in unnecessarily large amounts of emissions and that do not take advantage of the latest emissions reduction strategies and technologies for both new and renovated buildings (ASHRAE, 2022a).
3. Writers of codes for health care organizations such as the Facility Guidelines Institute, National Fire Protection Association, International Association of Plumbing and Mechanical Officials, and International Code Council, are risk averse. And, in many cases, data that are needed to determine the precise threshold at which a particular risk mitigation measure is optimal does not exist (e.g., air change rates in ventilation codes). Data to support specific measures (beyond just thresholds) do not exist, resulting in codes being written based on "expert consensus," which is the lowest level of evidence in the world of Evidence-Based Medicine. Codes do not necessarily leave room for experiments or trials to generate those data. Additionally, some codes are regulating earlier mid-points (i.e., air changes per hour) rather than feasible later midpoints (i.e., contaminants per cubic foot).
4. The lack of data leads to the creation of conservative limits, a reliance on previously adopted standards, and a reluctance to change.
5. Most jurisdictions have no incentives or requirements to drive down existing building emissions, though a number are starting to implement such measures (Building Decarbonization Coalition, n.d.). In some states, regulations actively prevent jurisdictions from the enactment of emissions reduction incentives and regulations (Brown, 2022). And the recent court decisions discussed previously make the regulatory terrain even more uncertain.
6. The ecosystem of designers, suppliers, builders, and operators of health care facilities is not aware of, educated to provide, nor widely accepting of lower carbon building strategies for many and varied reasons.
7. Generally, electrical systems in many existing buildings are sized for a system in which all heating loads are supplied by burning natural gas or other fossil fuels. Retrofitting the buildings to provide electric heat will require increases to electrical system capacities.
8. For new buildings, the National Electrical Code requires oversized electrical services for hospitals and other types of health care facilities, making the design of all-

electric buildings needlessly expensive and space consuming.

9. The current electrical grid will not easily support rapid transition of buildings to all-electric systems, which is required to eliminate Scope 1 emissions (EPA, 2024). This challenge includes the fact that transmission systems are poorly designed to access and distribute high quantities of low-carbon sources, and the fact that much generation capacity in the United States is still carbon-based. These realities create hesitation in many building owners and designers and can unnecessarily encourage the installation of on-site combustion systems, which are assumed to generate lower carbon emissions than buying electricity from the grid (Murphy et al., 2021).
10. The electrical grid is also increasingly experiencing outages due to, among other factors, increases in climate-related severe weather events (Climate Central, 2024). Reliable electricity is a prerequisite for quality health care, forcing increased attention to on-site energy storage and generation assets.
11. While current incentives are effective at encouraging overall energy efficiency, and while this is an important first step in achieving significant emissions reductions, there are no financial structures (except in some rare jurisdictions) that make carbon emissions reductions "lower cost" than business as usual.
12. Many health care organizations already have huge sunk costs in infrastructure that are not fully depreciated and that cannot be easily replaced without substantial incentives.
13. Misperceptions about the benefits of decarbonization strategies lead to installing new systems and equipment reliant on fossil fuel combustion, but that are less emitting than current systems. This line of thinking results in investments in carbon-heavy energy systems that are financially burdensome to replace when lower carbon emission strategies become required or more readily available. Replacement opportunity is likely to happen before the carbon-burning assets are fully depreciated or have otherwise reached the end of their useful lives. This carbon emissions "lock-in" problem is the fundamental reason why it is important to make investments now into all-electric solutions, even when they may, in the short term, result in higher carbon emissions in terms of source energy.
14. The magnitude of the finances required to make the necessary changes (i.e., a minimum of 50 percent reduction in emissions by 2030) is more than most health care organizations can afford, especially without using environmental attributes.
15. Health facilities that serve economically disadvantaged communities and rural populations tend to be even more financially challenged and therefore less able to make the needed investments in strategies that contribute to decarbonization efforts, many of which also improve the local air quality (*Pittsburgh Post-Gazette,* n.d.).

Opportunities for Policy Interventions to Catalyze and Accelerate Decarbonization of Health Care Facilities

A. Potential Federal Policy Interventions

As of June 2024, more than half of US states have passed laws preempting the ability of cities within their borders to enact requirements for all-electric new buildings (Gocke, 2024). Accordingly, deploying federal reimbursement and rulemaking for licensed health care buildings will provide critically important momentum in all communities. Potential federal actions include the following.

Action #A1:

CMS should require all new health care buildings in which reimbursed services are provided to be built according to the most recent edition of National Fire Protection Association (NFPA) codes and the Facility Guideline Institute (FGI) Guidelines (FGI, n.d.).

Current State: CMS is currently enforcing 2012 NFPA codes. Many jurisdictions adopt older or newer versions of these model codes, which creates conflicts between the two authorities. In some cases, the newer versions of the model codes provide more environmentally sustainable opportunities and remove outdated barriers to lower-emitting buildings. In 2023, CMS issued a categorical waiver, allowing health care organizations to use the most recently published version of NFPA 70, the National Electrical code, which permits the use of new technologies for emergency power systems.

CMS does not require conformance with FGI Guidelines for the design and construction of health care facilities, the consensus standard for minimum quality health facilities, and each state adopts different versions of this code. Because many jurisdictions do not update their requirements to newer versions of the model codes, institutions in these jurisdictions are required to build buildings that rely on old models of care and old technologies. Use of these older standards creates inefficiencies, especially with respect to energy use, which is closely tied to carbon emissions. The FGI Guidelines are focused on the delivery of high-quality health care services, which, in the aggregate, should improve outcomes, and thereby reduce the need for future health services driven by low quality.

Specific Regulation: CMS should consistently adopt the most recently adopted versions of NFPA 70, 99, and 101, and the three volumes of the FGI Guidelines. These standards should take effect on the first day of the year following issuance, for all new construction, and for relevant facility renewal.

Feasibility: In order to implement this policy, CMS must go through an administrative process, including public comment, before adopting new standards. This process consumes time and resources. But the benefit in terms of better, more efficient facilities with lower carbon emissions justifies the effort.

Impact: Health care organizations will be able to deploy clean energy technologies and methods that have been vetted and deemed safe. These technologies will reduce local emissions as well as global greenhouse gases. Also, this provides opportunities for health care organizations, rather than placing burdens on them.

Action #A2:

CMS should require compliance with the most recently DOE-certified edition of American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Standard 90.1 for all new buildings, additions, and renovations.

Current State: CMS has no minimum energy requirements for health care organizations. The Energy Conservation and Production Act requires the DOE to issue a determination, upon receipt of each iteration of ASHRAE Standard 90.1 (the de facto national energy code), on whether the new version improves energy efficiency (42 U.S.C. § 6833 (b)(2)(A); ASHRAE, 2019b). Once DOE issues its determination letter, states are required to certify that they have reviewed the provisions of their energy code and either adopt the new national energy code or certify that they already meet or exceed the new 90.1 requirements. Few states do this, and DOE has no enforcement mechanism.

Specific Regulation: CMS should require compliance with the DOE determination as part of all Conditions of Participation (CoPs). New construction, additions, and substantial renovations (i.e., more than 50 percent of the building area) must comply with the most recently certified ASHRAE 90.1, as certified by the DOE as a CoP.

Feasibility: This requirement is already federal law, but is poorly enforced.

Impact: This simple requirement, to follow existing federal law, will make a substantial improvement in the energy performance of new buildings across the United States. This action will at least slow the growth in new emissions, and, for replacement buildings, will begin their decline. This will also save the health care industry overall, since ASHRAE, in developing its standards, ensures the cost effectiveness of the requirements.

Action #A3:

CMS should develop, and Congress should fund, a health care decarbonization strategy for federally operated health care facilities (e.g., Defense Health Agency, Veterans Health Administration, Indian Health Service), in line with the emissions reduction targets of 50 percent by 2030 and 100 percent by 2050 in accordance with the 2021 Executive Order.

Current State: Former President Biden issued an executive order "aligning the management of Federal procurement and real property... to support robust climate action" (Exec. Order No. 14008). The Indian Health Service is already underfunded, with a large backlog of capital renewal projects, all of which could replace inefficient equipment with efficient, all-electric equipment (Indian Health Service, 2016). All of the federal health agencies conduct significant amounts of construction each year. Each building that the federal health agencies build that includes combustion equipment locks in decades of additional carbon emissions and sends the wrong market signals to the construction industry.

Specific Regulation: (A) HHS should immediately require that all federal health agencies with responsibility for facilities prepare a comprehensive Climate Action Plan and Decarbonization Strategy, with the most cost-effective mechanisms for reducing the absolute GHG emissions from Scope 1 and 2 emissions by at least 50 percent by 2030, and 100 percent by 2050. (B) HHS should then work with Congress to obtain necessary funding to implement the program.

Feasibility: Part (A) of this proposal is easily implementable within existing authority and requires minimal funding. Part (B) of this proposal is fraught with political difficulty, as it will require congressional action and funding. Nonetheless, this proposal is critical to ensure that the federal government "walks the talk."

Impact: Federal hospitals comprise 3.4 percent of the total number of US hospitals (American Hospital Association, 2024). The Veterans Health Administration is the largest integrated health care network in the United States, with 1,380 health care facilities serving over nine million enrolled veterans each year (US Department of Veterans Affairs, n.d.). The Indian Health Service provides a comprehensive health service delivery system: as of 2023 it served approximately 2.8 million of the nation's estimated 3.3 million people who identify as American Indians and Alaska Natives through a network of over 700 facilities in the United States. As of June 2023, the federal Indian Health Service system consists of 21 hospitals, 52 health centers, and 25 health stations (Indian Health Service, 2024; OMH, 2025). The Defense Health Agency operates multiple facilities in 38 states and the District of Columbia (Military Health System, 2023). Reducing emissions from these facilities will send a strong market signal that will accelerate needed change in the industry and reduce overall emissions from the sector. In recent times, this effort has become significantly easier with the development of software that can provide end-to-end decarbonization platforms, from automating evaluation of a large inventory of buildings, to energy and GHG emissions reporting, to plotting a portfolio's path to net zero via accretive retrofits. The US General Services Administration is currently piloting a cohort of software products as part of their "Net Zero Portfolio Analysis and Tracking" technology assessment under the Green Proving Ground Program (GSA, n.d.).

Action #A4:

HHS should require all future construction of health facilities by the federal government, including expansions and renovations, to be zero emissions buildings.

Current State: The DOE has released a definition of a zero emissions building (US Office of Energy Efficiency and Renewable Energy, 2015). Currently, this definition only addresses operating emissions. Former President Biden issued Executive Order 14057, requiring the decarbonization of federal buildings by 2045 (Exec. Order No. 14057). While this executive order has been rescinded by the

current administration, some federal agencies made efforts to comply, including the US Department of Veterans Affairs (US Department of Veterans Affairs, 2022; DOD, 2024). In addition, the HHS portfolio of buildings has achieved substantial reductions in GHGs compared to a 2008 baseline (HHS, n.d.). Yet, the work to date has involved reductions that are easier to achieve (i.e., Scope 2 procurement). And, as building loads move from fossil-fueled to electric, the need for on-site energy storage will grow as well.

At the same time, HHS has not mandated construction of zero emission federal buildings only, which is much more expensive and difficult than procuring zero carbon electricity for existing buildings. Agencies will need continued support at a greater level to continue their progress in reducing emissions, especially as the agencies simultaneously convert fossil fuel powered transportation to electric vehicles.

Specific Regulation: HHS should instruct all federal agencies with responsibility for construction of new, expanded, or renovated facilities to do so with no new fossil fuel combustion, from this point forward. The agencies should be funded appropriately with this requirement.

Feasibility: Former HHS Secretary Xavier Becerra noted, in creating the Office of Climate Change and Health Equity, that he would exercise all available legal authority to decarbonize the US health care sector. HHS has direct control over the facilities that it constructs. This requirement is likely to require additional funding.

Impact: The federal government moving in the direction of all-electric new buildings will send a substantial market signal, especially to the private health care sector. In addition, this step will ensure that the federal government does not make the problem worse by locking in decades of new GHG emissions from its new buildings.

Action #A5:

Congress should fund energy retrofits and electrification strategies for health facilities serving high percentages of Medicare and Medicaid patients, using a program similar to current Property Assessed Clean Energy (PACE) programs, but with initial funding from the federal government, and repayment from energy saved.

Current State: Organizations with higher percentages of Medicare and Medicaid patients tend to have fewer resources available to make needed investments in decarbonization. And they tend to be located in underserved areas, and areas with poor environmental conditions. In general, the health care industry suffers from poor margins, making capital for investment in decarbonization scarce (Emerson, 2023). In similar circumstances for other building types, many states across the country have enacted enabling legislation for PACE programs (EPA, 2025). Under these programs, the taxing authority provides capital to a building owner with which to implement energy and water consumption reduction projects. The building owner then repays the initial capital loan from the savings realized by those investments, over the life of the assets, to the taxing authority as a fee. Because the expense is a fee to a taxing authority, this financing system can occur off the balance sheet of the health care facility owner, making it an appealing way to finance a project.

Specific Regulation: HHS should provide 100 percent of the cost of decarbonization and water consumption reduction projects through loans similar to PACE programs, especially those dealing with Scope 1 emissions.

Feasibility: This action could be difficult to implement, as it will require an allocation of funds that could later be reimbursed. Possibly, this could be done with surcharges on private health care organizations that do not achieve decarbonization goals established by HHS.

Impact: This would be among the highest impact actions included in this discussion paper. In addition to accelerating emissions reductions, this strategy would improve local air quality in disadvantaged communities and be a high-impact intervention that would help ensure benefits for all.

Action #A6:

CMS should adopt regulations incentivizing a reduction of emissions and penalizing high emitters (existing buildings). Note, these regulations should provide special funding for less advantaged health care organizations (HCOs) to make necessary changes.

Current State: CMS does not currently require any performance with respect to energy consumption or carbon emissions from the health care sector. Numerous states and municipalities have begun to implement two kinds of energy and decarbonization strategies, one focused on new buildings, and one on existing buildings (Rocky Mountain Institute, 2022). The new building strategies tend to either require all-electric buildings, as previously discussed, or tilt the playing field toward all-electric buildings (Commonwealth of Massachusetts, 2022b). The ordinances focused on existing buildings generally set performance targets for all buildings of a certain type, based on the US Environmental Protection Agency (EPA) ENERGY STAR scoring system. These ordinances provide incentives for reducing energy consumption or emissions and impose penalties for failure to meet the targets. Most such ordinances set aside a certain amount of money to help especially economically disadvantaged building owners, to address considerations of fairness (City of St. Louis, 2020; City of Boston, 2021).

Specific Regulation: CMS should adopt a Building Performance Standard (BPS) for existing buildings that are used to provide services to Medicare and Medicaid patients. There are many existing examples from states and municipalities that can be used to model new regulations, including those from Maryland, Washington, Colorado, New York City, Boston, MA, and St. Louis, MO. In addition, in January 2024 ASHRAE published a new standard addressing this subject: Standard 100-2024, "Energy and Emissions Building Performance Standard for Existing Buildings." This document describes ways that jurisdictions can create both energy and emissions performance as a model building performance standard.

Feasibility: This regulation is within the scope of CMS authority. It would require no allocation of funds from Congress, as the penalties and incentives can be designed to be equal. There is ample precedent for the regulation, and the reporting burden is low, using the EPA ENERGY STAR program, since ENERGY STAR is already widely used by the health care industry (Introcaso, 2021).

Impact: The health care industry reacts primarily to regulation and to reimbursement. This one move can begin to get the attention of the industry at large and will start to move the industry toward true emissions reductions. In the authors' experience, jurisdictions with a BPS for existing buildings are showing real action by building owners working to comply with the regulations.

Action #A7:

The IRS should supplement the existing Community Benefit Standard with a requirement that not-for-profit hospitals must reduce Scope 1 emissions by a minimum of 4 percent per year until the achievement of a 100 percent reduction against a 2008 baseline, without the use of environmental assets (e.g., renewable energy credits (RECs) or carbon offsets). This reduction should exclude emissions from diesel fuel used for emergency power generators.

Current State: Much controversy surrounds the Community Benefit Standard (Letchuman et al., 2022). Much of the controversy focuses on questions regarding the method of establishing the amount of benefit provided relative to the tax benefit claimed (Lown Institute Hospitals Index, n.d.). The next question is what, aside from charity care, constitutes a community benefit (Zare et al., 2021). Reducing or eliminating Scope 1 emissions improves local air quality and community health by eliminating products of combustion (Commane and Schiferl, 2022). This air quality improvement is a definable community health benefit (California Energy Commission, 2018).

Specific Regulation: The IRS should require that, as an element of the community benefit

requirement to earn tax-exempt status, not-for-profit hospitals will reduce the emissions from Scope 1 building energy use a minimum of 4 percent per year until a 100 percent reduction has been achieved. This reduction must exempt fuel for emergency generators, and it must be achieved without RECs or carbon offsets.

Feasibility: The IRS has the authority to determine what constitutes a community benefit. Clearly, improving local air quality while simultaneously improving climate emissions protects the community health in a way that few other investments could achieve.

Impact: On-site combustion represents more than 50 percent of the Scope 1 and 2 emissions of a typical US hospital (Targeting 100!, n.d.). Systematically reducing Scope 1 emissions will have a significant impact on overall health care decarbonization, while eliminating these contributors to adverse local health impacts (California Energy Commission, 2018).

Action #A8:

CMS should make the TEAM (Transforming Episode Accountability Model) program mandatory.

Current State: CMS issued a draft program through its TEAM initiative in 2024. On August 1, 2024, CMS issued their responses to the comments and announced the coming final TEAM rule. This rule will permit any health care organization to report its emissions to CMS, through the EPA's free, voluntary ENERGY STAR Portfolio Manager tool, as well as other actions being taken to decarbonize the sector. In exchange, CMS will provide confidential feedback to the health care organization and provide them with as much help as they are able to accelerate change.

Specific Regulation: CMS should make the TEAM reporting system mandatory, as a CoP for all health care organizations.

Feasibility: CMS can require reporting of quality metrics for health care delivery. An increasing number of jurisdictions around the United States have implemented mandatory reporting of greenhouse gas emissions for all buildings, including health care buildings (DOE, 2019). Approximately 65 percent of US health care buildings already use the ENERGY STAR tool to track their energy and carbon emissions (Introcaso, 2021). These tools form the foundation for the American Hospital Association's Energy to Care program, and the International Federation of Healthcare Engineering's International Carbon Awards program. Hospitals enrolled in the Energy to Care program report a minor administrative burden from using these tools. Requiring disclosure is imminently feasible.

Impact: Studies show that benchmarking and transparency programs reduce aggregate energy consumption. The Energy Efficiency Improvement Act of 2015 required the DOE to study the impact of benchmarking and transparency programs across the country. Researchers from Lawrence Berkeley National Laboratories performed this study in 2017 (Mims et al., 2017). The study found that benchmarking and transparency programs, even in these early incarnations (24 jurisdictions through 2016) achieved aggregate energy consumption reductions of between 1.6 and 14 percent, in a relatively short time. This very simple new regulation would normalize requirements across the United States, rather than subjecting health care organizations to a patchwork of different requirements. It will reduce energy consumption and costs. It will also supply data to CMS to support the development of additional programs aimed at reducing emissions in a cost-effective manner.

Action #A9:

CMS should provide financing mechanisms to help health facilities overcome initial investment hurdles toward implementing decarbonization projects using the Inflation Reduction Act.

Current State: The Inflation Reduction Act is the most significant climate investment program the United States has ever made. Despite much excitement, the health care industry is slow to put it to use (Hartnett, 2023). Organizations report

two financial obstacles to accessing the money (assuming they have the technical capacity to implement a project). First, at best, the IRA will only pay 50 percent of the cost of a project. Many health care organizations cannot fund the other half of the needed investment. Second, even if they have that amount of cash (or bonding capacity), using it requires the health care organization to fund 100 percent of the project, and then to get reimbursed after the project begins operation.

Specific Regulation: Similar to Action #A5, CMS should provide the up-front capital to help struggling health care organizations to implement a qualifying decarbonization project. Once the project is complete, the IRS would issue the IRA reimbursement back to CMS. Then, CMS can use a program similar to PACE to recover the costs from the savings the health care organization will experience over some reasonable amount of time.

Feasibility: CMS has the authority to enact such a program. This program will not require new money and could even generate revenues to CMS if it charges an interest rate for the arrangement.

Impact: There are no reliable estimates for the energy, emissions, and cost reductions possible from maximum uptake of the IRA provisions by the health care sector. However, the health care industry represents approximately 20 percent of the US economy and 9 percent of the country's emissions (CMS 2024; Dzau, 2021). The Treasury Department estimates that the IRA will provide approximately $5 trillion in economic benefits by 2050 (US Department of the Treasury, 2024). Extrapolating, at 9 percent of the country's GHG footprint, maximum use of the IRA benefits would translate to an economic benefit of approximately $500 billion by 2050.

Action #A10:

Congress should amend the 179(D) Tax Deduction.

Current State: Section 179D of the Internal Revenue Code provides tax deductions for reducing energy consumption of buildings, both new and existing. For new buildings, savings are based on the results of an energy model comparing the projected energy use against a baseline. For existing buildings, it uses either energy savings projected by a model of energy consumption or, for existing buildings, the actual Energy Use Intensity (EUI). In this case, the estimated savings will consider only "building loads"—lighting, building envelope, and heating, cooling, ventilation, and hot water. The EUI approach includes all loads. The tax deduction can only be achieved by having a design that reduces energy consumption at least 25 percent below the model baseline, or below the measured EUI for an existing building. Incentives increase as energy reductions go from 25 percent to 50 percent below the baseline. Experience from the field shows that it is extremely difficult or virtually impossible for health care buildings, especially hospitals, to achieve these kinds of reductions. This is because of at least three issues: (1) health care buildings have many regulatory constraints, designed to ensure patient safety, that constrain the ability to achieve these kinds of savings; (2) the cost to achieve the current level of reductions against the baseline (25–50 percent) greatly exceeds the value of the potential deduction outcome; and (3) hospitals are full of equipment that provide care to patients and are not easily reduced (this is especially true for existing buildings). Also, the bulk of the health care providers are not-for-profit organizations that cannot take advantage of a tax deduction. The tax appetite of their contractors is also generally insufficient to take advantage of these opportunities. This situation is exactly the problem that led Congress to change other areas of the code, under the Inflation Reduction Act, from tax credits or deductions to direct pay to the not-for-profit entity.

Specific Regulation: Most important, the 179D deduction should be made a direct pay reimbursement, similar to other provisions in the Inflation Reduction Act. In addition, the limits for achieving the credit should be amended for health care organizations, or at least for acute care hospitals. Taking the current reduction targets

from the current range (25–50 percent) to a lower range (15–30 percent) would greatly accelerate investment into these kinds of energy reduction programs, with the associated reductions in GHG emissions.

Feasibility: This suggested requirement would require amendment to Title 26 of the US Code by Congress.

Impact: Experience from the field shows that a 10 percent reduction in energy consumption against the defined baselines (ASHRAE 90.1 or current EUI) is generally cost-effective. The proposed incentive could reasonably be estimated to result in another 10 percent reduction, on average, across the sector. A 10 percent reduction in energy use as a result of more widespread use of a 179D-like incentive would result in a reduction of many thousands of metric tons of CO2 emissions per year.

B. Potential State and Local Policy Interventions

Regardless of the pace at which the federal government may act, actions by states and local jurisdictions have now taken on much greater importance (Astor, 2022). States play a unique role with respect to the way health care buildings are built, as well as the way energy systems operate. States and local jurisdictions can play a crucial role in helping the health care industry achieve the needed decarbonization outcomes. Several states and local jurisdictions are already implementing policies, providing models for both other states and for the federal government (Melillo, 2022). Thus, while federal action can simplify the ability to achieve meaningful decarbonization at scale in the United States, state and local policy interventions can often be easier to achieve, albeit one state at a time. Most of the federal policy suggestions described in the previous section can be reframed as state or local initiatives.

Action #B1:

States and local authorities having jurisdiction should adopt regulations incentivizing existing buildings to reduce emissions and penalizing high emitters. Note, these regulations should provide special funding for less advantaged HCOs to make necessary changes.

Current State: Many states do not currently require the achievement of any performance benchmarks with respect to energy consumption or carbon emissions from existing buildings in the health care sector. Numerous states and municipalities have begun to implement regulations for emissions from existing buildings. These regulations generally set performance targets for all buildings of a certain type, based on US EPA ENERGY STAR scoring systems. These ordinances provide incentives for reducing energy consumption or emissions and impose penalties for not meeting targets. Most such ordinances set aside a certain amount of money to assist especially economically disadvantaged building owners, to address considerations of fairness (City of St. Louis, 2020; City of Boston, 2021).

Specific Regulation: States and municipalities should adopt regulations to reduce emissions from existing health care buildings that provide services to Medicare and Medicaid patients. These regulations should include a set-aside for buildings with insufficient resources to invest in emissions reduction projects. There are many existing examples from states and municipalities that can be used to model new regulations, including those from Maryland, Washington, Colorado, New York City, Boston, MA, and St. Louis, MO. ASHRAE Standard 100-2024, "Energy and Emissions Building Performance Standard for Existing Buildings," describes ways that jurisdictions can create both energy and emissions performance as a model building performance standard.

Feasibility: There is ample precedent for the regulation, and the reporting burden, using the EPA ENERGY STAR program, is low since ENERGY STAR is already widely used by the health care industry (ENERGY STAR, 2021; Introcaso, 2021).

Impact: The health care industry reacts primarily to regulation and to reimbursement. This single move can get the attention of the industry at large and will start moving the industry toward true emissions reduction. Initial experience at the State of Washington, the City of St. Louis,

and the City of Boston are showing real action by building owners working to comply with the recently enacted regulations.

Action #B2:

States should facilitate widespread adoption of all-electric requirements for new buildings.

Current State: There is disagreement between states with regard to all-electric mandates. While there are many proponents for local action on climate change mitigation, there are constituencies that prefer the status quo of treating all fuels as equal (such as gas utility companies, as well as people who are not supportive of local action based on political ideology or concerns over lack of regulation uniformity). Eleven US states and the District of Columbia have either taken action on building electrification or contain local governments that have taken such action (Rocky Mountain Institute, 2022). Some states have adopted "reach codes" for energy consumption, permitting local jurisdictions to do better than the model code, but with uniform provisions across local jurisdictions within the state (Berg, 2022). Massachusetts follows this path, while also permitting a limited number of jurisdictions to pass all-electric building codes (Commonwealth of Massachusetts, 2022a). However, as of June 2023, there are 24 US states that have adopted regulations that preempt the ability of jurisdictions within their borders to adopt requirements for all-electric buildings (Gleason, 2022).

Specific Regulation: States should permit all jurisdictions within their borders to require new buildings to be all-electric, except as needed for on-site generation for emergency use. If this is not politically feasible, states should follow the lead of Massachusetts and permit a limited number of jurisdictions in the state to adopt such regulations. Whenever possible, states should adopt reach codes, to allow local jurisdictions to have access to more aggressive requirements, if they so desire.

Feasibility: The fact that several states across the country have already followed this path shows that it is completely feasible. Health care in much of the rest of the world is already all-electric, so technically, it can be done (IFHE, 2022). The primary impediment is political. There are economic interests that are threatened by regulation. Conflicting studies have concluded that all-electric building codes are both more expensive and less expensive than regulations permitting methane combustion (American Gas Association, 2020; Rocky Mountain Institute, 2018). Some opponents of these requirements note the need to potentially upgrade the electrical grid and generation capacity to be able to support electrification. Some commentators raise concerns about the fairness of all-electric requirements (Bryce, 2020). Other analyses rebut these concerns. Some fear that the need to preserve an option for fossil fuel-driven emergency power systems might be overlooked by those drafting new codes or regulations. Nevertheless, it is certain that these kinds of regulations will accelerate decarbonization. A more important concern is the trend to adopt regulations that apply to buildings in general, which are not tailored to health care buildings. More importantly, in the opinion of the authors, broad, one-size-fits-all building performance standards usually do not work well for the realities of 24/7 critical care facilities. These regulations need to include provisions that make them feasible for health care.

Impact: Slightly more than 50 percent of the energy consumption of hospitals derives from methane (Targeting 100!, n.d.). Making new hospitals all-electric will reduce Scope 1 emissions virtually to zero and will enable a dramatic reduction in Scope 2 emissions as grids decarbonize. Electrifying hospitals now will eliminate local air quality problems caused by burning fossil fuels. Electrifying hospitals now will also eliminate the need for costly and disruptive renovations later.

C. Potential Organization Policy Interventions

The health care industry represents almost 20 percent of the US economy (CMS, 2024). As such, it is supported by hundreds of organizations focused on countless aspects of delivering quality, affordable health care. These organizations, collectively and individually, can influence the design of clinical practice, as well as the systems that support such practice. Policies of these organizations offer even

more opportunities to help move the industry toward the goal of decarbonization.

Action #C1:

The Joint Commission (TJC) and other accrediting organizations should require compliance with ASHRAE 90.1, and the latest edition of NFPA codes and FGI Guidelines for all new construction, as described previously.

Current State: TJC currently surveys all licensed hospitals for compliance with the 2012 editions of the NFPA codes because this is the requirement of CMS.

Specific Regulation: Once CMS revises their standards to require compliance with the most recently issued version of NFPA standards (and FGI Guidelines), TJC should update the survey standards to reflect this change.

Feasibility: This change should be simple—once CMS acts.

Impact: See description provided for Action #A2.

Action #C2:

TJC should move its current voluntary Sustainability Standard to a mandatory standard.

Current State: In 2023, TJC introduced proposed standards related to environmental sustainability. The proposed standards were minimal, yet an important step toward engaging all health care institutions in the movement to decarbonization. Despite their minimal nature, the proposed standards created significant industry pushback. As a result, TJC withdrew the proposed standards and created a voluntary sustainability certification that launched in January 2024 (TJC, n.d.).

Specific Regulation: Health care organizations now have experience using the TJC certification tool. TJC should move the voluntary program back to its mandatory accreditation standards.

Feasibility: One of the major criticisms of the original programs was that TJC has no expertise to manage something like sustainability in health care. The successful launch and implementation of the current voluntary program removes this objection. The other objection to the requirement was its burdensomeness in the face of otherwise overwhelming pressures on health care organizations to simply deliver patient care. Experience with the current voluntary system shows that the burden of implementation is de minimis. TJC can use this learning to show others that it can be done. Criticisms of the voluntary program, especially around current sustainability practices in multi-hospital health care systems, should be considered when creating a mandatory standard.

Impact: As noted, the requirements of the current program will not, in themselves, make a large impact. What they will do is to get the entire industry moving in the right direction. It is likely that, as individual institutions begin to achieve some initial successes, they will discover that it is not so difficult to make progress, and they will experience the benefits of positive community image, staff morale, and reduced costs. These experiences will propel them to do more.

Action #C3:

TJC and other accrediting organizations should develop the ability to review and certify the GHG emissions inventory of facilities.

Current State: Recognized international standards are available for the development of GHG emissions inventories. For example, the Greenhouse Gas Protocol Corporate Standard is a global standard that helps companies prepare GHG inventories that are accurate and fair, and that can help them manage and reduce emissions (Greenhouse Gas Protocol, n.d.). It also aims to increase consistency and transparency in reporting across companies and programs. In addition, the International Organization for Standardization (ISO) completed the development of ISO 14064 (the International Standard for GHG Emissions Inventories and Verification) in 2006. While these standards address verification of the accuracy and completeness of an inventory, there is no national

consistency in the requirements for building owners in the United States to validate GHG inventories. Therefore, the quality of the inventories by health facilities is likely to be highly uneven. This leaves the industry open to claims of greenwashing and lack of credibility.

Specific Regulation: Organizations should have their emissions inventories reviewed and verified by various accrediting organizations for reporting to the federal government and to the public. TJC should perform a study and certification of these accrediting organizations, as well as require similar measurement protocols for all health care organizations.

Feasibility: Systems of accounting for GHG emissions are well established and accepted (World Resources Institute and World Business Council for Sustainable Development, 2004). TJC could add a process to review and accredit these measurements and reports or rely on third-party certifiers.

Impact: Reliable data is the foundation for meaningful action. And standardized data will allow regulators to better assess the progress of health care organizations toward carbon reduction goals. This measure, in itself, will not *directly* reduce emissions. However, it provides the foundation on which meaningful progress can be made on all the other ideas noted in this discussion paper.

Action #C4:

The American Hospital Association (AHA) and its Professional Membership Groups (PMGs) should provide rapid and effective education and mobilization of the HCO facility ecosystem to drive, or at least support, the needed evolution in decarbonization.

Current State: In the authors' experience, most designers, builders, and operators of health care buildings are familiar with industry standards of care. Health care is, in general, a risk-averse culture. In architectural thinking, form follows function; thus, this risk-averse industry has become surrounded by a possibly even more risk-averse community of designers, builders, operators, and regulators. The process by which codes evolve is very slow. Most model codes operate on an update cycle of 3 or 4 years. After they are published, it can take years for jurisdictions to adopt them. Yet, to make the leap toward a decarbonized future, a spirit of aggressive innovation, experimentation, and sharing is essential. Otherwise, the scale and pace of change will not meet the needs of this moment. The development and deployment of new technologies, including in ways that challenge existing regulation and thinking, will also need to be supported. It will be important to pilot these new technologies, learn from failures, and scale successes. This kind of change needs a driver, a change agent. With nearly 5,000 hospitals and health care systems, networks, and other providers as members, as well as scores of allied professionals, the AHA and its PMGs are the ideal drivers for this needed change. The AHA and its PMGs are already starting work in this critical endeavor.

Specific Regulation: The AHA and its PMGs must make it a core part of their strategic plans to motivate and drive its members to work together to ensure industry-wide success in achievement of the 50 percent reduction by 2030 goal. These organizations can provide critical awareness of the issue and focus efforts to educate their members. AHA can encourage the needed spirit of experimentation and peer-to-peer learning. It can develop behavior change programs like the Energy to Care Program it has been leading for almost a decade. AHA should also partner with Health Care Without Harm and—using the collective energy, expertise, and reach of the two organizations—catalyze a grassroots decarbonization movement.

Feasibility: Three of the PMGs of the AHA came together in 2012 to conceive and launch the AHA Sustainability Roadmap. A follow-on to that was the very successful Energy to Care program. AHA represents almost 5,000 US hospitals and health care organizations, as well as suppliers and service providers. AHA and its PMGs are among the most

influential actors in this sector, and it needs to use that influence to drive the needed change.

Impact: AHA and its PMGs could take a meaningful role in moving the industry, and they can have a tremendous impact if they provide the needed focus.

D. Potential Model Code Developers' Policy Interventions

Action #D1:

ASHRAE should collaborate with multiple parties including NIH, CDC, and others to create an evidence-based ventilation code.

Current State: A large amount of energy consumption in a health care building consists of ventilation energy. Energy used to deliver ventilation air consists of electricity for fans, as well as the energy required to filter, dehumidify (or humidify), and heat and cool the air (Targeting 100!, n.d.). Most states enforce ASHRAE Standard 170 as a health care ventilation code. Some states enforce a derivative of ASHRAE 170 (State of California, 2019). Thus, *some* version of ASHRAE 170 is almost universally the law of the land. CMS does not explicitly adopt and enforce any version of ASHRAE 170, but it does require compliance with the 2012 Edition of NFPA 99. NFPA-99-2012 requires compliance with an outdated (2008) version of ASHRAE 170. CMS will also defer to state regulations under certain conditions.

A 2019 study conducted by ASHRAE and FGI found that there is no evidence to support the specific ventilation requirements in ASHRAE 170 (ASHRAE, 2019a). The adopted purpose and scope of ASHRAE 170 explicitly excludes consideration of energy consumption or carbon emissions in its requirements. ASHRAE has recently adopted a position document regarding decarbonization (ASHRAE, 2022a; ASHRAE, 2022b). This position document, approved by the ASHRAE Board, commits the organization to "strengthen the decarbonization components of ASHRAE standards every three to five years, consistent with achieving a fully decarbonized environment by 2050," noting that this means that: "By 2030, the global built environment must halve its 2015 GHG emissions, whereby all new buildings are net zero GHG emissions in operation" and "widespread energy-efficiency retrofits of existing assets are well underway" (ASHRAE, 2022b). Finally, the most recent edition of the ASHRAE Position Document on Infectious Aerosols used a version of Evidence-Based Medicine (EBM) as a process for the first time for any ASHRAE document. Among the considerations used by this process in this document is the carbon emissions impact of potential risk mitigation strategies, thus setting a precedent for further development by ASHRAE. ASHRAE has also been advancing Standard 241, a more robust effort focused on reducing the risk of disease transmission through exposure to infectious aerosols in buildings. This methodology could be used in demand-controlled ventilation systems for health care facilities.

Specific Regulation: ASHRAE should revise the Title, Purpose, and Scope of ASHRAE 170, requiring it to use an EBM process, including GHG emissions as a valid consideration in accordance with the Decarbonization Position Document approved by its board. ASHRAE should expedite the issuance of a new, evidence-based ventilation code on this basis. ASHRAE should permit demand-controlled ventilation, possibly based on Standard 241, rather than its current approach, which is more fixed and prescriptive. As an alternative, another organization could take on the urgently needed exercise of creating a ventilation standard for health care facilities that is supported by EBM. This alternate standard would then need to supplant references to ASHRAE 170 throughout the many documents that reference the ASHRAE ventilation standard.

Feasibility: The effort to complete this policy is anticipated to require a significant amount of research, partly due to the large variety of space types in health care settings. As such, there is

no way to accomplish an effort like this without governmental leadership and participation. Similar research has been successfully completed for the purpose of proposing evidence-based modifications to ASHRAE 170 requirements for patient room ventilation (Guity et al., 2009). It is very reasonable to assume that similar research will be able to establish justifiable changes to the current standard's ventilation rates based on patient and staff safety models, which will help establish evidence-based ventilation requirements that are equivalent to or better than current standards with anticipated reductions in energy use and related emissions.

Impact: As previously noted, the impact of ventilation on health care energy consumption and its attendant GHG emissions is a very large part of the overall emissions of the buildings. Tailoring ventilation requirements will therefore help make new buildings less expensive to build, less consumptive, less emissive, and less expensive to operate, while protecting the health of the building occupants. And, because most existing building ventilation systems are adjustable, such a change will provide an immediate opportunity to reduce consumption and emissions from existing buildings at virtually no first cost, resulting in significant ongoing operational savings.

Action #D2:

There is an urgent need for the creation of a health care-specific BPS.

Current State: As noted in the background section of this discussion paper, achieving a 50 percent reduction goal from health care facilities necessitates that no new buildings include on-site combustion of fossil fuels. To this end, numerous jurisdictions across the country are passing requirements for all-electric buildings (City and County of San Francisco, 2021). In general, these regulations apply to all buildings, and they are not well-tailored to health care buildings with their unique needs for resilience to support community health, risk mitigation to protect occupants from infectious aerosols, and provisions to protect a high proportion of occupants with reduced abilities for self-perseveration. This current one-size-fits-all approach can be highly problematic for designers, builders, and operators of health care facilities. This mismatch frequently results in resistance from the health care community to the adoption of these kinds of regulations. There is a strong need for model codes that can be adopted by jurisdictions across the United States that are appropriate and feasible for health care buildings.

Specific Regulation: Experienced model code development organizations are well-placed to develop this needed model code. The primary organizations for this purpose are NFPA and ASHRAE. These two organizations could collaborate with others (such as Architecture 2030, which already developed a model code for zero-net-carbon buildings, and the University of Washington's Integrated Design Lab, which created the pivotal "Targeting 100!" roadmap) to create a model all-electric code specific to health care buildings (Architecture 2030, 2018). As an alternative, any of these organizations could create, alone, the needed model code (University of Washington Integrated Design Lab, n.d.).

Feasibility: Both NFPA and ASHRAE are experienced in the development of model codes using American National Standards Institute (ANSI) procedures. Both organizations are widely known and highly respected, and their codes are widely adopted. Details of a collaboration include obstacles to overcome. ASHRAE already publishes both a model energy code and a high-performance health care facilities standard (ASHRAE, 2021b). NFPA has already published NFPA 99: the Health Care Facilities Code. Thus, there may be reluctance to supplant these existing efforts. However, both ASHRAE and NFPA regularly collaborate with the American Society for Health Care Engineering (ASHE), the buildings PMG of the AHA. It might be easier for ASHE to sponsor and create the needed

model code in collaboration with both ASHRAE and NFPA. The process of building model codes can be extremely slow, so this effort should be expedited.

Impact: Creation of a health care-focused set of requirements to drive all-electric new construction, especially if done in conjunction with ASHE, will greatly ease the adoption of such a model code by states and municipalities across the country. Such requirements will drive the elimination of new buildings that use on-site combustion of fossil fuels. And they would also serve as a guiding light for existing buildings. This is a critical step in moving the industry toward its necessary decarbonization goal.

Conclusion

As previously noted, recent developments in the judicial arena have made it more difficult for agencies to implement regulations of any sort. In addition, executive action by the federal government may not be a driver for climate action in the near term. And yet, in the midst of the hottest years in recorded history, the imperative to drive down emissions grows more urgent every day.

Some people still think reducing emissions will cost too much. Analyses have shown that, at a population level, investments in climate change mitigation reduce health care costs (California Energy Commission, 2018). The climate is, in some ways, the ultimate market failure. Investments by one party in strategies to mitigate emissions have impacts that are diffuse in both geography and time; the beneficiaries are all of us, near and far, now and in the future. Because the climate is a market failure, the only way to address it is collectively. And because this may be difficult, it is important to act at all levels and all branches of human governance in order to preserve the health of people and the world, and to take advantage of the economic benefits of doing so.

The authors of this discussion paper hope that the audience that receives it will exercise their power to implement the policy initiatives outlined herein. These actions will help accelerate progress toward addressing the climate challenges faced by all and will make significant strides toward achieving the National Academy of Medicine's goals to support a 50 percent reduction of the current climate footprint of the US health care sector by 2030.

Appendix

kBTU/sf/year = thousand British thermal units per square foot per year. This is a common metric used to express the energy consumption of a building. Note that there are some challenges with measuring emissions as a function of building area. For instance, an enterprise that makes more intense use of its facilities or operates longer hours in order to avoid constructing a new building might have a higher energy use per square foot per year than a less active organization. This metric will make the organization that achieves higher productivity per square foot appear less energy efficient. Also, from the perspective of an integrated health system, measurement as a function of building area ignores all of the non-building emissions, including those that reduce the amount of needed care, and those, like telemedicine, that keep people out of medical buildings. A much more appropriate metric for comparing health care emissions is likely to be emissions per covered life. Nevertheless, academic debates over metrics are far less important than making needed reductions, and the essence of this discussion paper is to prescribe policies that lead to reductions, regardless of the measuring stick.

"Environmental attributes" broadly refers to a reduction in GHG emissions—or an increase in carbon storage (e.g., through land restoration or the planting of trees)—that is used to compensate for emissions that occur elsewhere. The issue of offsets is tricky. It is far cheaper for most institutions to avoid investing in reducing their own emissions by purchasing inexpensive carbon offsets. However, offsets vary significantly in quality. Thus, offsetting can provide an excuse for avoiding real emissions reduction and create a dangerous mirage of "climate neutrality" when emissions are actually rising. It can also lead to greater emissions once carbon is re-released into the atmosphere when temporary stores are utilized as offsets (e.g., forest sequestration). But, because they tend to be less expensive and easier than investments into actual reductions by an entity, they tend to be alluring, short-term fixes.

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