Accelerating Health Equity and Business Resilience through Decarbonization

Action Guide for Board Directors

2023

Prepared by the Commonwealth Fund, the Black Directors Health Equity Agenda (BDHEA), and Deloitte Consulting LLP
What is health equity?
Health equity means that every person has the opportunity to achieve their full potential in all aspects of health and well-being. Board directors have a meaningful role to play in helping advance equitable health outcomes both within and outside the organizations they serve.

What is business resilience?
Business resilience is an organization’s ability to withstand, lead, and thrive amid disruption. This document highlights how organizations across the U.S. health ecosystem, can use decarbonization to drive business resilience and improve overall performance.

What is decarbonization?
Decarbonization is the process of reducing carbon dioxide and other greenhouse gas (GHG) emissions. Decarbonization is critical to mitigating climate change and its disproportionate impacts on historically marginalized communities.

1) Deloitte; 2) Deloitte; 3) IPCC
*This document contains information relevant to organizations across the health ecosystem, including health systems, health plans, and pharmaceutical and medical technology companies
How to Use this Document

**NAVIGATION TIPS**
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**01 | The Health Ecosystem’s Climate Crisis**

Look to the top left of any page for a reminder of where you are in the action guide

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**If you have 15 minutes**

Skim sections 1, 2, and 5 to understand the climate crisis and key actions for board directors

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**If you have 45 minutes**

Review all sections, focusing on actionable decarbonization strategies and key steps for board directors in sections 3 & 5

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**If you have 90 minutes**

Read the end-to-end action guide to understand the full case for change, case study insights, and smart next steps
Executive Summary

The health sector has played a significant role in the ongoing climate crisis, contributing ~8.5% of total U.S.-based greenhouse gases (GHGs) that are responsible for climate change.¹ The negative impacts of emissions-driven climate change are happening now.

The impacts of climate change threaten human health and health equity. Climate change impacts (e.g., wildfires, extreme heat) can worsen the incidence of chronic disease and disproportionately exacerbate health disparities for historically marginalized populations.

Health care stakeholders increasingly expect the industry to be a part of the solution. From regulators, to employees, to communities, pressure is mounting for health care leaders to implement decarbonization strategies that limit the effects of climate change.

Health care board directors can help enable a more sustainable, resilient future and catalyze meaningful action by elevating sustainability and climate considerations in their spheres of influence.

Five actions every board director can take:

1. Understand health care’s role in the ongoing climate crisis
2. Elevate the linkages between climate change and health equity
3. Understand your emissions footprint and what it means to decarbonize
4. Frame the benefits of decarbonization as a business imperative
5. Understand the role of the board in governing decarbonization

¹ NEJM, The Commonwealth Fund, HHS
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A Note from The Authors

This document is the third in a series of related resources for board directors released by the Black Directors Health Equity Agenda (BDHEA). This document expands upon the ESG Playbook to provide a detailed perspective on decarbonization.

The creation of this action guide was a collaborative effort from the Black Directors Health Equity Agenda (BDHEA), Deloitte, and the Commonwealth Fund. For more information on the authors, please refer to the Appendix.
The science is unequivocal; a global increase of 1.5°C above the preindustrial average and the continued loss of biodiversity will risk catastrophic harm to health that will be impossible to reverse...Indeed, no temperature rise is ‘safe.’

— Joint statement from over 200 medical and health journals

Understand the ongoing climate crisis and what it means for leaders across the health ecosystem
We are in the midst of a climate crisis driven by economic activity

Economic activity – powered by the combustion of fossil fuels – has resulted in a rapid increase in the concentration of greenhouse gases (GHGs) in our atmosphere; the impacts on our planet, its people, and its biodiversity are happening now.

**About Greenhouse Gases**

- GHGs in the earth’s atmosphere trap heat and regulate the earth’s temperature.
- GHGs are emitted into the atmosphere by both natural processes and human activities.
- Human activities increase GHG concentrations by adding carbon dioxide and other gases into the atmosphere and reducing the ability of natural “sinks” to store carbon.
- An excess of GHGs can trap too much heat in the atmosphere and cause the planet to warm.

**The Latest Science**

- GHG concentrations are their highest in two million years; global temperature rise is projected to reach 3.2°C in this century.
- To limit the worst climate impacts, the Intergovernmental Panel on Climate Change states that we need to limit global temperature rise to no more than 1.5°C…
- …which will require cutting global GHG emissions in half by 2030 (from 2010 levels) and reaching net-zero emissions by 2050.

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1) EPA  2) IPCC
The U.S. health care sector is a material contributor to GHG emissions

The U.S. health care sector contributes ~8.5% of total U.S.-based GHG emissions\(^1\) and approximately 25% of global health care sector emissions,\(^2\) driven by a few underlying factors.

**High Standard Of Care**

Many health care facilities (e.g., hospitals, manufacturing plants) operate continuously, and all must comply with the highest standards of hygiene, safety, and quality.

Redundant processes play an important role in safeguarding against provider error, but can also generate substantial system waste\(^3\).

**Energy Demands**

Lifesaving medical equipment, manufacturing processes, heating and cooling, and cold storage drive high rates of energy use and are often powered by fossil fuels.

Hospitals tend to have a high energy use intensity, nearly three times the average commercial building energy use\(^4\).

**Waste Generation**

Health care and life sciences operations generate substantial wastewater and solid plastic, food, medical, & pharmaceutical waste that require emissions-heavy processing.

U.S. hospitals generate 3.4 billion pounds of solid waste annually; a single hysterectomy, for example, can produce up to 20 pounds of waste, most of which is plastic\(^5\).

**Complex Supply Chains**

Health care organizations often operate complex supply chains and rely on extended distribution networks that further drive emissions across the value chain.

80% of active pharmaceutical ingredients (APIs) – critical to pharmaceutical production – make their way to the U.S. from either China or India\(^6\).

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1) NEJM; 2) Health Affairs; 3) Brookings; 4) U.S. Department of Energy; 5) Environmental Science & Technology; 6) Harvard Business Review
Health sector emissions are projected to continue to rise

Even with current government energy and climate commitments, the volume of U.S. health sector emissions is expected to continue to increase over the next 30 years.

The future of U.S. health sector emissions will fall roughly within the bounds of three scenarios:

**Scenario 1: “Business as Usual”**
Forecasted growth in U.S. health sector emissions with no further emissions mitigation or abatement.

**Scenario 2: “Current Mitigation Commitments”**
Forecasted growth in U.S. health sector emissions in line with U.S. government-led energy and climate commitments.

**Scenario 3: “Aggressive Mitigation”**
Forecasted growth in U.S. health sector emissions with aggressive mitigation and abatement strategies in place beyond current government-led commitments.

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1) Health Care Without Harm; data used to create these scenarios focus specifically on health systems – pharmaceutical manufacturers are represented in part via health system Scope 3 emissions.

*CO2e is the universal unit of measurement used to indicate the global warming potential (GWP) of GHGs. **Current commitments include nationally determined contributions (NDCs) as articulated by multilateral agreements such as the Paris Agreement.
Health ecosystem stakeholders increasingly expect companies to help mitigate emissions-driven climate change

**Communities** are...

Expecting health care organizations to promote environmental health as a core driver of health and health equity

65% of individuals say it is important that health care organizations engage on climate change to earn or keep their trust

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**Employees** are...

Recognizing climate change as a leading public health risk and increasingly demanding purposeful employer action

Organizations representing the interests of 46M health care workers have named the climate crisis “the greatest threat to humanity”

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**Payers** are...

Increasingly recognizing climate change as a business risk that will put upward pressure on the total cost of health care

Air pollution and climate change already generate more than $800B health-related costs annually in the U.S.

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**Government Agencies** are...

Moving toward mandatory climate risk disclosures and developing frameworks to manage and incentivize decarbonization

The SEC has considered requiring large public health care companies to report on climate risks, and CMS continues to move toward issuing official guidance around climate change

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**Accreditation Bodies** are...

Incorporating sustainability into evaluation frameworks that could influence accreditation processes

The Joint Commission, which accredits 80% of U.S. hospitals, is expected to offer new accreditation standards addressing climate change within a few months

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**Investors and Donors** are...

Incentivizing sustainable ESG strategies with favorable financing terms and the rise of “green” funding vehicles

70% of investors believe that more socially and environmentally responsible investments present a higher financial return
In response to these pressures, public and private actors across the health ecosystem are mobilizing to meet this moment.

The public sector and other multilateral institutions continue to create frameworks to drive climate action:

- **(2015) Paris Agreement**: International treaty adopted by 196 Parties at COP 21 in Paris with the goal to limit warming.

- **(2021) UN Race to Zero**: Commitment by 40+ global health care institutions to halve emissions by 2030 and achieve net zero by 2050.

- **(2022) HHS Health Sector Climate Pledge**: Historic commitment by over 100 U.S. health care organizations to halve emissions by 2030.

- **(2023) WEF Zero Health Gaps Pledge**: First-in-kind global pledge to mobilize executive leadership to prioritize health equity.

…and private sector stakeholders are responding with their own commitments to decarbonize:

- Kaiser Permanente becomes first major health system to reach carbon neutrality.
- Gundersen Health Systems is on a Mission to Remain Energy Independent.
- Massachusetts hospitals are joining the climate fight.
- CommonSpirit Announces Industry-Leading Commitment to Reach Net-Zero by 2040.
- Pfizer Announces Commitment to Accelerate Climate Action and Achieve Net-Zero Standard by 2040.
- CVS Health advances sustainability efforts through purchase of renewable energy.
- Atrium Health leaders pledge to reduce carbon emissions at White House event.

Work remains to be done; the sections that follow provide actionable guidance for board directors to think about their emissions footprint, implications for human health and health equity, and strategies to decarbonize.
Climate change is the single biggest health threat facing humanity...While no one is safe from these risks, the people whose health is being harmed first and worst by the climate crisis are the people who contribute least to its causes, and who are least able to protect themselves and their families against it.

— The World Health Organization

1) WHO
As climate change accelerates, human health suffers

Although the climate crisis is generally perceived as an environmental issue, the impacts of the changing climate will have an increasingly acute impact on human health unless aggressive mitigation efforts are taken.

IMPACTORS

- WILDFIRES
- RISING SEA LEVELS
- EXTREME HEAT
- SEVERE WEATHER
- AIR POLLUTION
- DROUGHTS

IMPACTED

- RESPIRATORY
- NEUROLOGIC
- INCREASED MIGRATION
- INCREASED FOOD INSECURITY
- HEAT-INDUCED ILLNESS
- INFECTIOUS DISEASE

Individual Health Events

- Emissions-driven air pollution causes 6.5M premature deaths worldwide annually,\(^1\) including 3M cardiovascular disease deaths\(^2\)
- Climate change causes anxiety-related responses as well as chronic and severe mental health disorders\(^3\)
- Climate-related disasters displace ~25M people a year, with 143M additional climate migrants expected globally by 2050\(^4,5\)
- By 2050, climate change is predicted to reduce global crop yields by an average of 10% and up to 50% in some areas\(^6\)
- More than 1 in 3 global heat-related deaths can be attributed to climate change\(^7\)
- Warmer temperatures make new areas hospitable to vector borne diseases (e.g., the chikungunya virus now exists in the U.S.)\(^8\)

System-wide Public Health Trends

1) The Lancet; 2) American Heart Association; 3) American Psychiatric Association; 4) Internal Displacement Monitoring Center; 5) World Bank Group; 6) IPBES; 7) Nature Climate Change; 8) DSHS

Note: This visual is an adaptation from Deloitte, “Why climate resilience is key to building the health care organization of the future.”
Climate risks across the U.S. exacerbate health inequities

**EXAMPLE CLIMATE RISK**

Warmer temperatures are increasing the frequency of wildfires in the Pacific Northwest and the prevalence of airborne particulates that cause asthma.

Rising temperatures in the Southwest are increasing the frequency of extreme heat events while also creating the conditions for extreme precipitation in certain areas.

Since the 1950s, winter storm tracks have shifted northward in the Midwest and Plains States with increased frequency and intensity.

The Northeast has experienced increased rates of coastal flooding and more frequent heavy downpours over the past three to five decades.

The Southeast has seen increased hurricane intensity, frequency, and duration which will continue to impact 10 of 15 of the fastest growing U.S. cities.

**EXAMPLE IMPACT ON HEALTH EQUITY**

Black and Hispanic/Latino Americans, particularly children, suffer disproportionately from asthma and other respiratory conditions affected by air quality.

Latino migrant workers, who constitute 50%–75% of U.S. agricultural workers, are more 20x more likely to die from heat-related illnesses due to increased rates of exposure.

Industries utilizing hazardous materials are often located in communities of color, increasing risk of illness related to toxic contaminant exposure after flooding.

People of color are more likely to experience displacement during hurricanes, which is linked to mental health issues such as post-traumatic stress disorder.
The impacts of climate change are felt at the individual patient level

Climate change will disproportionately impact the health of communities that have been historically marginalized; in these illustrative examples we share how those impacts might materialize based on factors including, but not limited to, race, socioeconomic status, ability, gender, age, etc.

**Brianna is at risk for asthma**, and exposure to pollution, limited tree canopy, and a lack of access to healthy foods combine to elevate her risk profile. Brianna’s symptoms are becoming more acute with increased frequency of extreme heat days and nearby wildfires that contribute to airborne particulate matter.

**Mauricio suffers from diabetes**, and his doctors have recommended dialysis. Adherence to these time-intensive and expensive treatments has always been difficult, but an incoming hurricane has left few good options. Extreme flooding has closed dialysis centers and at-home care cannot reach Mauricio’s home.

**Ana is expecting a child**, and the financial burdens of preparing for a baby are taking a toll on her physical health. This stress is compounded by her living situation; Ana’s borough is considered a “heat island”, an area that experiences extreme temperature hikes, especially during summer months.

**Edie has early signs of dementia** and has been struggling to age in place as her mobility becomes a challenge. Her home isn’t equipped with air conditioning – she’s never really needed it in the past – but recent summer heat waves have made her once comfortable home too hot to bear.
We believe that those of us who have the privilege to serve in health care also have an obligation to address this major threat. Specifically, we can mobilize to reduce our own carbon footprint and take actions to improve our system’s resilience and adaptability to climate change.

— Decarbonizing the U.S. Health Sector: A Call To Action¹

¹) NEJM

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The health ecosystem contributes to all four main GHGs, each varying in their respective lifespan and global warming potential

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<th>GLOBAL WARMING POTENTIAL</th>
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<tr>
<td>Carbon Dioxide</td>
<td>300 years – 1,000 years</td>
<td>1</td>
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<td>Methane</td>
<td>11.8 years</td>
<td>27.9</td>
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<td>Nitrous Oxide</td>
<td>109 years</td>
<td>273</td>
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<tr>
<td>Chloro-fluorocarbons</td>
<td>Up to 50,000 years</td>
<td>Up to 25,200</td>
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</table>

1) [EPA][3] 2) [IPCC (AR6 Values)]; Global Warming Potential (GWP) expressed in carbon dioxide equivalent or CO2e and GWP 100, or the energy absorbed by the gas over 100 years.

1) Emitted during the combustion of fossil fuels to power health facilities, the transport of materials, patients, and employees, and the decomposition of biological materials.

2) Emitted during the decomposition of food waste, certain agricultural and farming practices (e.g., dairy manure), and via oil, natural gas, and coal production used to power health facilities.

3) Emitted at point-of-use as an anesthetic gas as well as via health and pharmaceutical product manufacturing, certain agricultural practices, and wastewater treatment.

4) Emitted through refrigerants used in medical chillers, pharmaceutical storage, and general cooling; these synthetic, powerful GHGs are also used as anesthetics.
Health care GHG emissions originate from three main scopes; decarbonization requires emissions reduction strategies across each scope.

- **Scope 1**: Direct emissions that occur from owned or directly-controlled sources
  - Emissions from company facilities and manufacturing
  - Emissions from company-owned vehicle fleets
  - Point-of-use medical gases and anesthetics (if applicable)

- **Scope 2**: Indirect emissions from the generation of purchased energy used by the entity (combustion occurs elsewhere)
  - Emissions generated from purchased electricity, steam, heating, or cooling

- **Scope 3**: Emissions that occur in the entity’s upstream and downstream value chain via sources not owned or controlled by the entity
  - Emissions generated via upstream supply chain activities
  - Emissions generated by agriculture for patient nutrition and catering
  - Emissions generated via downstream use, transport, and waste disposal
  - Emissions generated via company investment portfolios

Note: Emissions sources for health ecosystem informed by EPA and WHO. For a full list of Scope 1, 2, and 3 emissions categories, refer to the GHG Protocol.
Scope 3 emissions are the dominant emissions source across industries

Across the U.S. health care ecosystem, Scope 3 emissions are dominant (~64%), followed by Scope 1 (~21%) and Scope 2 (~15%)

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<td><strong>Example Emissions Sources</strong></td>
<td><strong>Example Emissions Sources</strong></td>
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<td><strong>Scope 1 ~21%</strong></td>
<td><strong>Scope 3 ~64%</strong></td>
<td><strong>Scope 2 ~15%</strong></td>
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<td>Facility operations</td>
<td>Medicine, device, and single-use material manufacturing</td>
<td>Facility operations</td>
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<td>Point-of-use medical gases</td>
<td>Agricultural practices to support patient nutrition</td>
<td>Company vehicle fleets</td>
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<td>Company vehicle fleets</td>
<td>Business travel and employee commuting</td>
<td>Company vehicle fleets</td>
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<td><strong>Purchased energy (electricity, heating, cooling)</strong></td>
<td><strong>Financed emissions via asset management portfolios</strong></td>
<td><strong>Purchased energy (electricity, heating, cooling)</strong></td>
</tr>
<tr>
<td><strong>Medicine, device, and single-use material manufacturing</strong></td>
<td><strong>Emissions generated via benefit expenses (e.g., mail-order drugs)</strong></td>
<td><strong>Upstream manufacturing processes</strong></td>
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<tr>
<td><strong>Agricultural practices to support patient nutrition</strong></td>
<td><strong>Business travel and employee commuting</strong></td>
<td><strong>Pharmaceutical and cold chain transportation and distribution</strong></td>
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<tr>
<td><strong>Business travel and employee commuting</strong></td>
<td><strong>Medical waste processing and transportation</strong></td>
<td><strong>Sourcing of raw materials for active pharmaceutical ingredients</strong></td>
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<tr>
<td><strong>Medical waste processing and transportation</strong></td>
<td><strong>New facility construction</strong></td>
<td><strong>Business travel and commuting</strong></td>
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<tr>
<td><strong>New facility construction</strong></td>
<td><strong>Upstream manufacturing processes</strong></td>
<td><strong>Hazardous waste disposal and end-of-life treatment processes</strong></td>
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<tr>
<td><strong>Purchased energy (electricity, heating, cooling)</strong></td>
<td><strong>Financed emissions via asset management portfolios</strong></td>
<td><strong>Use of sold products (e.g., inhalers)</strong></td>
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Note: Emissions mix estimates based on Health Care Without Harm analysis; data used to create these estimates focuses specifically on health systems, but Deloitte analysis of publicly available ESG reports for health plan and pharma/med tech companies corroborates the relative breakdown of Scope 1, 2, and 3, emissions across the health ecosystem. Percentages should only be considered directional as the frameworks for reporting continue to evolve, particularly around Scope 3.
Health care organizations can reduce their emissions footprint through these common decarbonization strategies

**ENERGY EFFICIENCY**
Design infrastructure and facility footprint to optimize for resource efficiency and introduce green, energy-efficient tech into operations
- e.g., green building technology, all-electric building construction, HVAC system and lighting modifications

**RENEWABLE ENERGY**
Power operations through renewable energy sources through on-site energy generation or green purchase power agreements
- e.g., on-site electric microgrids or solar panels, green purchase power agreements

**SUPPLY CHAIN OPTIMIZATION**
Reduce reliance on disposable and single-use supplies and incorporate local, sustainable, and circular principles in procurement
- e.g., supplier sustainability scorecards, procurement from community-based agriculture, food waste reduction strategies

**CLINICAL INNOVATION**
Improve overall system effectiveness, eliminate unnecessary care, support preventative care, and introduce new processes that limit the volume and toxicity of waste
- e.g., reduced single-use items, lean principles in clinical workflows, on-site waste treatment, prevention efforts

**LOW-CARBON MEDICINES**
Substitute high-emission products with more climate friendly alternatives, and incentivize the production of climate-smart medication
- e.g., low fresh gas flows, regional anesthesia techniques, alternative medicine delivery mechanisms, green R&D and chemistry

**TRANSPORTATION EFFICIENCY**
Limit transportation-related emissions via zero-emission fleets, active travel and public transport, and hybrid health care strategies
- e.g., telehealth / remote patient monitoring, hybrid work models, incentives for use of public transit or active travel, zero-emissions fleets for sales representatives

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Click here to learn more about decarbonization tactics and ways to prioritize their selection (pg. 45)

Note: Decarbonization strategies informed by EPA GHG Reduction Programs and Strategies.
Beyond emissions reduction, decarbonization strategies can enable broader board director priorities that help improve overall business resilience

## OPPORTUNITIES TO IMPROVE BUSINESS RESILIENCE

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<th>Transform Patient Experience</th>
<th>Enable a Leading Talent Experience</th>
<th>Enable Agile Operations</th>
<th>Modernize Data Management</th>
<th>Advance New Alliances</th>
<th>Reimagine the Supply Chain</th>
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<tr>
<td>Increase access to virtual appointments and hybrid health care (e.g., telehealth)</td>
<td>Implement hybrid work models that reduce commute times and limit business travel</td>
<td>Design adaptive and modular facilities that can adapt to changes in patient demand</td>
<td>Shift data storage from on premise to lower-emission cloud providers</td>
<td>Forge partnership with local businesses that improve supply chain resilience and lower distribution costs</td>
<td>Invest in local manufacturing and sourcing to shorten distribution distance</td>
</tr>
<tr>
<td>Enable remote diagnostics and chronic care management</td>
<td>Subsidize public transit and offer incentivizes for active travel (e.g., biking)</td>
<td>Promote energy efficiency through retrofit projects and facility modifications</td>
<td>Use real-time data enabled by the Internet of Things (IoT) to optimize demand planning</td>
<td>Co-invest with suppliers to design and fund new sustainability programs and strengthen institutional and community relationships</td>
<td>Re-shore capabilities of strategic importance to improve supply chain reliance</td>
</tr>
<tr>
<td>Support community-based care models that increase equitable access and proximity to care</td>
<td>Incentivize employees to implement sustainable practices into their workflows</td>
<td>Implement product packaging standards that are lower weight and lower cost</td>
<td>Leverage advanced analytics to understand and forecast emissions and impacts on health</td>
<td>Invest in energy efficient processes such as continuous manufacturing</td>
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Implementing a comprehensive decarbonization strategy involves four key steps for management—each with distinct considerations for board directors:

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<th>Understand Emissions Footprint</th>
<th>Define Emissions Target</th>
<th>Identify &amp; Activate Strategies</th>
<th>Measure and Report Progress</th>
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<tr>
<td>Collect and aggregate requisite data, with a focus on supplier data, to understand current and projected emissions footprint</td>
<td>Define short and long-term emissions targets by considering both organizational and stakeholder priorities</td>
<td>Prioritize decarbonization strategies based on clear criteria (e.g., impact, equity) and define the activation strategy</td>
<td>Summarize the impact of decarbonization strategies and communicate to key stakeholders</td>
</tr>
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</table>

**Key Steps**

- How sophisticated is our data management strategy and architecture across Scopes 1, 2, 3?
- What are our emissions “hotspots”? What communities are our emissions disproportionately affecting?
- How will planned strategic initiatives and our growth aspirations impact our emissions footprint?
- What do emerging regulatory frameworks require of us?
- How aggressive do we need to be to address stakeholder needs?
- Do we understand the costs of inaction or insufficient action (e.g., reputational risk, regulatory risk, litigation)?
- Do we understand the costs of missing our emissions targets?
- What abatement strategies do we need to meet our emissions targets?
- Could decarbonization strategies support other ongoing organizational priorities?
- Which suppliers should we prioritize working with on Scope 3 emissions?
- How could we use decarbonization efforts to promote more equitable and more resilient communities?
- What level of disclosure is mandatory vs. voluntary for our sector?
- How will the market and/or other stakeholders react to our progress?
- Can we meet (or exceed) reporting requirements in a way that builds goodwill or brand equity?

**Board Considerations**

- How will planned strategic initiatives and our growth aspirations impact our emissions footprint?
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Note: The use of the term “decarbonization” in this case is synonymous with emissions reduction or abatement—the process of curbing emissions in order to reduce the concentration of certain gases in the environment that contribute to planetary warming and climate change.
Understand the business imperative for decarbonization and how it applies to board directors and the organizations they serve.

As an organization you have to decide you are a citizen of the community and you are going to act for the well-being of the community, which means having some courage and having some long-range planning, instead of just next month or next quarter.

— Jeff Thompson, MD
CEO Emeritus, Gundersen Health System

1) Door County Pulse
There are many reasons for board directors to prioritize decarbonization

**Equitable Health & Well-being:** Advance health equity, reduce chronic disease burden, and improve climate resilience in communities of operation

**Risk Mitigation:** Future-proof the business against long-term risks including environmental, regulatory, and compliance risks

**Trust & Reputation:** Build reputational equity and improve brand sentiment across key stakeholders including employees, patients, and customers

**Financial Incentives:** Take advantage of incentives such as emerging “green” financing mechanisms, tax credits, and stronger performance in equity markets

**Operational Efficiency:** Improve overall business performance and protect margins through optimization of resource use and reduced system waste

**Supply Chain Resilience:** Protect against supply chain vulnerabilities such as price surges, changes in long-term costs, or shortages of key supplies

**Example Proof Points**

- Reducing global greenhouse gas (GHG) emissions could **prevent 4.5M premature deaths** over the next 50 years.\(^1\)
- Extreme weather events **cost health systems anywhere from $22,000 to $22M** in damages, closures, evacuations, etc.\(^2\)
- More than **70% of employees** are more likely to choose to work at a company with a strong environmental agenda.\(^3\)
- Green, social, and sustainability-linked bond volumes hit a **record $1.35T** in 2022.\(^4\)
- Reducing waste and cutting energy usage in U.S. health care facilities can save an estimated **$15 billion over ten years**.\(^5\)
- Among companies with sustainability programs, two thirds achieved **lower logistics and supply chain costs**.\(^6\)

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1) Nature Climate Change; 2) U.S. News and World Report; 3) Fast Company; 4) Moody’s; 5) Commonwealth Fund; 6) Pure Strategies
## Equitable Health & Well-being

Advance health equity, reduce chronic disease burden, and improve climate resilience in communities of operation

<table>
<thead>
<tr>
<th>EXAMPLE BENEFITS</th>
<th>SUPPORTING DATA</th>
</tr>
</thead>
</table>
| **Reduce chronic disease burden in local communities** by mitigating the direct emissions that contribute to airborne particulate matter | • A longitudinal study found a strong correlation between shortened life spans and low air quality\(^1\)  
• 50% of the world’s population is at risk from environmental threats from improperly treated waste, including emissions from waste incineration\(^2\) |
| **Improve access to care through hybrid health care strategies** (e.g., telehealth) that provide quality health care and reduce transportation and facility emissions | • More than 80% of physicians indicate their patients have better access to care since using telehealth\(^3\)  
• A study of telemedicine use in oncology treatment estimated 19.8 kg CO\(_2\)e saved per visit for patients within 60 minutes of the site of care\(^4\) |
| **Strengthen communities of operation** through partnerships that promote community resilience via emissions abatement (e.g., local food supply, tree planting, ecosystem restoration) | • Linking decarbonization with community goals such as affordable housing and economic opportunity elevates public support for climate-change mitigation, especially in communities of color\(^5\) |

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1) *Science of the Total Environment*; 2) *Health Care Without Harm*; 3) *AMA*; 4) *JAMA*; 5) *NEJM*; 6) *AHRQ*; 7) *California Association of Food Banks*
Risk Mitigation

Future-proof the business against long-term risks including environmental, regulatory, and compliance risks

**Example Benefits**

- **Future proof against environmental risks** through decarbonization strategies that also reduce the threat of operational and care delivery disruptions
  - Extreme weather events can cost a hospital anywhere from $600,000 to $2B in damages\(^1\)
  - Delayed recovery at NYC hospital after Hurricane Sandy prompted Moody’s to review the hospital’s credit rating\(^2\)

- **Reduce exposure to emerging regulatory standards** (e.g., accreditation processes, building codes, carbon taxes) through proactive compliance
  - 50% of fossil fuel assets (e.g., diesel boilers) could be rendered useless by regulation by 2036\(^3\)
  - Twelve states have elected to put a price on carbon via cap-and-trade policies; in California, these prices are expected to increase by 5% annually\(^4,5\)

- **Limit the risks of shareholder activism and potential climate-related litigation** (e.g., class action lawsuit) through proactive decarbonization
  - Court cases related to climate action increased by 6x in the last decade, and as of 2021 there had been over 1,800 climate change cases filed globally\(^6,7\)

**Supporting Data**

\(^1\) U.S. News and World Report; \(^2\) Becker’s Hospital Review; \(^3\) Nature Energy; \(^4\) C2ES; \(^5\) RHG; \(^6\) World Economic Forum; \(^7\) Deloitte & WEF; \(^8\) Health Care Without Harm

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**CASE STUDY: Improved Resiliency at Texas Medical Center**

**CONTEXT**

In 2001, **historic flooding** crippled Texas Medical Center (TMC), the largest medical complex in the U.S. Water damage to an emergency generator caused a **complete power outage** and galvanized support for an **overhaul of the system’s approach to utilities**.

**APPROACH**

Efforts focused on a new **on-site, combined heat and power plant** that eliminated dependence on Houston’s utility grid during both normal and emergency operations while also reducing costs and overall emissions.

**IMPACT**

Texas Medical Center investments in resilience were put to the test with **hurricanes in 2005, 2008, and 2017**. In 2017, despite citywide flooding from Hurricane Harvey, **all TMC hospitals and emergency rooms stayed operational**.
**Trust & Reputation**

Build reputational equity and improve brand sentiment across key stakeholders including employees, patients, and customers

---

**EXAMPLE BENEFITS**

- **Improve talent attraction and engagement** through a purpose-driven talent experience that uses upskilling and incentive programs to decarbonize
  
  - New hires at Gundersen Health System cite sustainability as a top reason to work there.  
  - 58% of health sector executives anticipate that enhanced ESG reporting will improve talent attraction and retention.

- **Foster positive market and brand sentiment** through participation in voluntary reporting programs that demonstrate commitment to ESG
  
  - Brands that exhibit strong purpose are 6x more likely to be protected in the face of negative publicity.
  - 52% of health sector executives anticipate that enhanced ESG reporting will improve reputation and enhance brand.

- **Improve stakeholder trust** and loyalty through publicizing decarbonization progress and positioning as a purpose-driven organization
  
  - 76% of consumers are more likely to trust a purpose-driven company; when consumers perceive a brand having a strong purpose, they are 4x more likely to purchase from the company.

---

**SUPPORTING DATA**

- **Context**
  
  As part of its broader decarbonization strategy, and to enable a more equitable talent experience, Mass General Brigham offered eligible employees tailored incentives to promote active travel and reduce dependence on single-occupancy vehicles.

- **Approach**
  
  All employees were offered monthly MBTA pass subsidies of 50%. The health system also installed electric charging stations, sponsored the city’s bike share program, and offered remote work as an option to corporate employees.

- **Impact**
  
  Over 50% of employees* have transitioned to public transportation, reducing both the system’s emissions footprint and parking-related real estate costs. The health system is well regarded for its comprehensive transportation incentives and consistently ranks among the top hospitals to work for in the U.S.

---

1) Practice Greenhealth; 2,4) Deloitte; 3,5,6) Deloitte; 7) Health Care Climate Council; 8) Glassdoor

*Figure applies only to employees located in Boston/Somerville where public transit is available.
## Financial Incentives

Take advantage of incentives such as emerging “green” financing mechanisms, tax credits, and stronger performance in equity markets

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Realize tax benefits</strong> by taking advantage of tax credits and incentives designed to reduce the burden of installing abatement technologies</td>
<td>• Installation of a $10M, small-scale solar panel could be eligible for a maximum of $7M in U.S. federal credits depending on the degree of alignment with Inflation Reduction Act requirements¹</td>
</tr>
<tr>
<td><strong>Generate stronger performance in equity markets</strong> through strong ESG performance and reporting that private investors increasingly value</td>
<td>• 82% of investors agree (35% “strongly agree”) that ESG integration will lead to outperformance in equities over the next three years²</td>
</tr>
<tr>
<td><strong>Access alternative forms of financing</strong> to fund projects that have positive environmental and/or climate benefits (e.g., green bonds, sustainability-linked bonds)</td>
<td>• 28% of institutional investors map their portfolios against UN Sustainability Goals (up from 3% in 2018)³</td>
</tr>
</tbody>
</table>

1) Deloitte analysis; 2) bFinance; 3) Boston Medical Center; 4) Harvard Business Review; 5) Business Wire; 6) Pfizer; 7) Pfizer ESG Report

### CONTEXT

In 2020, Pfizer launched a **$1.25 billion sustainability-linked bond**, the first to be issued by a biopharma company. Bond proceeds are to fund energy efficiency, water conservation, reduced waste, and construction of “green buildings”.

### APPROACH

The bond **pays interest semi-annually at a rate of 2.625% and matures in 2030**. Pfizer engaged in an accreditation process with Sustainalytics, an ESG research agency, that confirmed the bond framework was credible and aligned with UN Sustainability Goals.

### IMPACT

Proceeds in part supported the development of a new, emissions-friendly API manufacturing facility. Several major investors upgraded their internal ESG ratings for Pfizer based on bond marketing materials.
Operational Efficiency

Improve overall business performance and protect margins through optimization of resource use and reduced system waste

**EXAMPLE BENEFITS**

- Improve energy efficiency via green construction and infrastructure retrofits (e.g., green building tech, zero-emission fleets, data center modernization)
  - Introduction of green building technology can reduce energy usage up to 40% and save 10%-30% in overall building maintenance costs
  - Reducing energy usage across Veterans Affairs hospitals has resulted in $1.7B in long-term savings

- Optimize land, water, and solid materials use by limiting single-use products and adopting circularity principles
  - The annual economic loss of plastic packaging represents $80B –$120B, or 95% of material value
  - One hospital system’s implementation of reusable gowns resulted in savings of $3.5M over 4 years

- Increase care value through elimination of redundant processes or introduction of lower-carbon alternatives that reduce emissions
  - Addressing inefficiencies in care delivery, care coordination, overtreatment / low-value care, pricing, and fraud / abuse could save the U.S. health care system more than $190 billion annually

**SUPPORTING DATA**

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**CASE STUDY: Improving Operational Efficiency at Gundersen Health**

**CONTEXT**

In response to rising energy costs, Gundersen’s executive leadership team launched an energy audit to identify actionable opportunities for energy savings that would also have a positive impact on the system’s emissions footprint.

**APPROACH**

The design of Gundersen’s energy conservation strategy was truly cross-functional and engaged stakeholders from operations to IT. Efforts first focused on pumps, controls, and lighting and then subsequently on boilers, data center upgrades, and new-age chillers.

**IMPACT**

Within a year, Gundersen improved energy efficiency by 25%, resulting in more than $28 million in cumulative financial savings since 2008. Data center upgrades have resulted in a power usage efficiency rating that is now regarded as “best in class.”
Supply Chain Resilience

Protect against supply chain vulnerabilities such as price surges, changes in long-term costs, or shortages of key supplies

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</table>
| **Limit supply chain vulnerability** by reducing supply chain length and “re-shoring” select capabilities where appropriate | • Among companies with sustainability programs, two thirds achieved lower logistics / supply chain costs¹  
• 80% of the U.S. supply of active pharmaceutical ingredients (APIs) come from China or India² |
| **Reduce exposure to fluctuating fossil fuel costs** through fixed-contract renewable energy sources (e.g., microgrids, purchase power agreements) | • Purchase power agreement prices are normally below analyst forecasts of future electricity prices³  
• Switching to three-year, fixed purchased power agreements for hydroelectric power saved one hospital 10%–15% in energy costs⁴ |
| **Improve supplier relationships and engagement** by investing in training, capacity building, and co-development of decarbonization solutions | • 95% of buyers believe that suppliers who demonstrate environmental leadership are overall better business partners⁵  
• Designing supplier contracts that reward mutually desired outcomes improves results and trust⁶ |

¹) Pure Strategies; ²) HBR; ³) U.S. Dept of Energy; ⁴) Health Care Without Harm; ⁵) CDP; ⁶) HBR; ⁷) Kaiser Permanente; ⁸) Health Care Climate Council

CASE STUDY: Upholding Supplier Standards at Kaiser Permanente

CONTEXT
Kaiser Permanente developed its rigorous Environmentally Preferable Purchasing (EPP) Standard in 2017, mandating specific environmental criteria be met in purchasing decisions.

APPROACH
Kaiser Permanente established five priority areas for their EPP Standards – energy, chemicals, waste, food, and water – and mandated that current and prospective suppliers comply with the sustainability standards.

IMPACT
The EPP program achieved over $63 million in cost savings for Kaiser Permanente. Since its inception, the EPP program has also delivered environmental savings reaching approximately 2,400 tons of waste reduced and 87,000,000 kWh of electricity saved.
Decarbonization and the Role of the Board

Review the role of the board in governing decarbonization and strategic questions designed to help drive productive dialogue.

However real and credible these obstacles are, what’s manifestly clearer is that no board or audit committee can afford to use them as reasons for inaction or waiting to see how things unfold over time. Change isn’t coming; it’s already upon us.

— Deloitte Global, “Board leadership and the fight against climate change”

1) Deloitte Global
The governance of ESG topics, including decarbonization, typically includes six competency areas at the board level.

**STRATEGIC INTEGRATION:** Embed climate considerations into strategic planning in a way that informs decision-making processes and incentivizes enterprise transformation.

**MATERIALITY:** Assess the short and long-term materiality of climate-related risks and opportunities for the organization on a regular basis.

**TALENT & INCENTIVES:** Ensure that the selection, evaluation, and compensation of the CEO and executive leadership is aligned to decarbonization goals.

**STRUCTURE & GOVERNANCE:** Determine the most effective way to integrate climate considerations into board structure, committees, and processes.

**REPORTING & DISCLOSURE:** Ensure that material climate-related risks, opportunities and strategic decisions are consistently and transparently disclosed to all stakeholders.

**COLLABORATION:** Maintain regular exchanges and dialogues with peers, investors, suppliers, and other stakeholders to encourage the sharing of methodologies and collective action.
## Considerations for Board Directors | Strategy, Risk, and Opportunity

### LEADING SUCCESS FACTORS

#### Strategic Integration
- Climate resilience and decarbonization are **thoroughly integrated** into the strategic planning process:
  - We understand how decarbonization aligns with business priorities and our mission
  - We use enterprise-wide, climate-focused performance indicators to inform planning and decision-making
  - We have dedicated resources (e.g., FTEs, technology) focused on decarbonization and climate resilience

### GUIDING QUESTIONS

- How can we embed decarbonization into **existing board priorities** and enterprise strategic initiatives?
- What should our strategic **decarbonization goals and targets** be? Are these goals aligned with the market?
- How can we create and communicate long-term **organizational value** through decarbonization?
- What investments in **people, processes, and technologies** are required to activate our strategy? Do we have sufficient resources to support these investments?

#### Materiality
- The materiality of climate-related risks and opportunities are **well understood and monitored** by our board and management:
  - We include climate-related considerations in our assessments of short & long-term risks and opportunities
  - We conduct regular, scenario-based exercises to understand how climate risks and opportunities could materialize across different stakeholder groups
  - We have well defined processes to discuss material climate risks and oversee their delegation to management

- What are the **material climate-related risks** and opportunities for the organization in the short and long term?
- Are we effectively hedging against **future material risks** given what we know to be true about stakeholder expectations?
- Does the board understand the **costs of inaction vs. action**? What tradeoffs are we willing to make?
- How can the board monitor the **speed** at which we should move (i.e., quick wins vs. long-term investments)?
Considerations for Board Directors | Oversight and Governance

LEADING SUCCESS FACTORS

Ownership and accountability for decarbonization at the board level is achieved through **formal structures and commitments**:

- We have formally delegated oversight of our decarbonization strategy to the board and/or board committees and have documented that responsibility via respective charters
- We have a standalone sustainability board committee with climate expertise
- We have board-level commitment to a decarbonization strategy and/or science-based targets

GUIDING QUESTIONS

- Does our board have the **right experience** to provide effective oversight along the organization’s decarbonization journey?
- Does our **board evaluation process** include opportunities to assess effectiveness of board oversight on decarbonization and climate resilience?
- Do management updates and presentations allow the board to **effectively monitor progress** and performance against decarbonization / climate resilience goals?

Talent & Incentives

The board **rewards sustainable value creation** by incentivizing climate action across executive leadership:

- We support leadership development to ensure management has a baseline understanding of this topic
- We have designated an accountable owner (e.g., Chief Sustainability Officer and/or Chief DEI Officer) to manage climate priorities and climate impacts on health
- We tie executive compensation to climate-related metrics and performance against decarbonization targets

- Is our board “smart” on decarbonization topics? Are our C-suite and management? What **gaps in understanding** exist?
- Who within our organization is well positioned to lead on decarbonization and climate resilience? Do we need to create a new **C-suite or executive management role**?
- What climate-related **actions and outcomes** do we want to **incentivize** across the C-suite? How can we hold the C-suite accountable for achieving those outcomes?
### Considerations for Board Directors | Stakeholder Engagement

#### LEADING SUCCESS FACTORS

**Reporting & Disclosure**

- External reporting on climate governance includes **robust, material disclosures** on decarbonization-related goals:
  - We publish our climate-related ambition and / or an ESG report in alignment with leading frameworks and standards
  - We enable reporting through clear processes and internal data management / quality controls
  - We have external assurance processes in place related to external reporting

#### GUIDING QUESTIONS

- What is the **current state** of our ESG and decarbonization-related reporting? What gaps exist?
- Do we understand the **risks of “greenwashing”** or potentially missing our decarbonization targets?
- Can we leverage any of our current **capabilities, tools, and/or solutions** to enhance reporting and controls?
- How can we regularly **communicate** priorities, goals, and progress to key stakeholders?

**Collaboration**

- Collaboration on decarbonization includes **sharing leading practices and data** with communities and other stakeholders:
  - We consult with external organizations to ensure alignment with emerging climate-governance standards
  - We share our methodologies and approaches with peers, investors, suppliers, etc.
  - We gather data on climate change impacts on health equity in areas where we operate and share with community orgs.
  - We organize stakeholder dialogues and encourage participation of customers, regulators, NGOs, academia

- Which stakeholders will be most impacted by climate action / inaction? How should the board engage with **those who are most impacted**? What level of engagement is appropriate?
- How can we promote **data sharing** across internal (e.g., physicians) and external stakeholders (e.g., suppliers, GPOs)?
- How can we use decarbonization and climate resilience as a platform to **strengthen the communities** we operate in?
- Do we want to be seen as a **leader or a follower** in this space? How could we inspire collective action?
Discussions with leaders from around the health ecosystem yielded the following advice for board directors

**Remain focused on the board’s mandate and priorities…**

“Boards care about risk mitigation, and when you look at the pace of regulatory change in this space and what it means for a health care operation, the regulatory risk is real.”

**Set clear, centralized decarbonization targets…**

“It is great to create an environment where employees feel empowered to integrate decarbonization into their workflows, but ultimately top-down targets incentivize the most positive change.”

**Appeal to the mission of health care to “do no harm”…**

“We are in the business of helping people optimize their health and overcome disease. Creating disease through harmful environmental impacts is incompatible with our collective mission.”

**Be data-oriented and strive for data transparency…**

“Sharing data can be very effective. Leadership will rally around this if they have the data, but they don’t respond well to ‘this is what you have to do and there is no other option’.”

**Assign clear ownership and accountability…**

“Things like climate resilience and health equity often become one-eight of a job for a lot of people. There are often not enough identified owners of this kind of work.”

**Open lines of collaboration with partners, suppliers, and peers…**

“When we bring together providers, payers, manufacturers, and GPOs all into the same dialogue…that is how we rethink how we do care.”

Note: Quotes were sourced from interviews with leaders across the health care ecosystem including providers, health plans, and pharma / med tech.
To help mitigate the worst impacts of climate change through decarbonization, board directors should consider taking the following five actions:

1. **Understand health care’s role in the ongoing climate crisis**
   - Ecosystem stakeholders increasingly expect the health care ecosystem (and the boards that oversee them) to be a part of the solution to emissions-driven climate change.

2. **Elevate the linkages between climate change and health equity**
   - Board directors can be a voice for historically marginalized communities that are often most vulnerable to the impacts of climate change.

3. **Understand your emissions footprint and what it means to decarbonize**
   - Meaningful decarbonization will likely require a coherent enterprise-level roadmap informed by leadership priorities and enabled by collaboration with suppliers and partners.

4. **Frame the benefits of decarbonization as a business imperative**
   - The benefits of decarbonization will vary depending on the realities of each organization; board directors can help identify where decarbonization aligns with existing priorities.

5. **Understand the role of the board in governing decarbonization**
   - Successful board-level governance of decarbonization typically includes six key competency areas; the degree of maturity in each competency area will likely vary by organization.
Appendix

I. Understanding Climate Change Impacts on the Patient Journey

II. Health Care Decarbonization Strategies

III. Supplemental Definitions

IV. Note from the Authors and Acknowledgements

Click here to return to the Table of Contents
Appendix I: Understanding Climate Change Impacts on the Patient Journey
Brianna’s Journey | Climate Impacts on Respiratory Disease

Brianna is a 49-year-old, Black woman who lives in Los Angeles County, California. Brianna is a cashier at a local big box retailer and enjoys her work and engaging with customers. Recently, however, she’s noticed that she has had trouble catching her breath. She has never considered herself at risk for asthma, so she shrugs off her symptoms as a normal part of the aging process.

Economic and social drivers of health elevate Brianna’s risk profile…

Like many minimum wage workers, Brianna does not have access to medical benefits and, as such, doesn’t have a consistent primary care provider that could have spotted her symptoms early. She also struggles to maintain a healthy weight; South LA County is considered to be food desert, which also raises her risk.

….this risk is compounded by environmental drivers of health…

For most of her life, Brianna has unknowingly been exposed to smog and air pollution that can contribute to respiratory disease. She hasn’t noticed the correlation, but her symptoms are more acute during days of extreme heat and during wildfire season when airborne particulate matter envelops the city.

….and contributes to observable differences in health outcomes

Her symptoms continue to worsen. One day, while at the park with her partner and kids, Brianna can’t catch her breath. Her partner rushes her to the emergency room.

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Like many minimum wage workers, Brianna does not have access to medical benefits and, as such, doesn’t have a consistent primary care provider that could have spotted her symptoms early. She also struggles to maintain a healthy weight; South LA County is considered to be food desert, which also raises her risk.

Asthma prevalence in LA county is 18.4% among the Black population as compared to 8.1% in the white population8

Los Angeles County, CA

<table>
<thead>
<tr>
<th>Economic and social drivers</th>
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<tbody>
<tr>
<td>% Black Pop. in Poverty1</td>
<td>20%</td>
</tr>
<tr>
<td>% Black Pop. Food Insecure2</td>
<td>12%</td>
</tr>
<tr>
<td>% of Black Pop. Uninsured3</td>
<td>12%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental drivers of health</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Poor Air Quality Days4</td>
<td>286 per year</td>
</tr>
<tr>
<td>Wildfire-Related Risk5</td>
<td>High</td>
</tr>
<tr>
<td>Extreme Heat Days6</td>
<td>14 per year</td>
</tr>
<tr>
<td>% Area with Tree Canopy7</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

1) United States Census Bureau, 2020; 2) County of LA Public Health; 4) American Lung Association; 5) LA Times; 6,7) U.S. News & World Report; 8) Asthma Coalition of LA County
Mauricio’s Journey | Climate Impacts on Chronic Care Management

Mauricio is a 65-year-old, Hispanic man living in suburban Houston, Texas. He is a retired construction worker but likes to stay busy with volunteer work. Mauricio also suffers from Type 2 diabetes. He had been managing his condition with an insulin pump, but recently his doctors have suggested dialysis treatment. He turns on the television to find a hurricane is in the forecast for the Gulf Coast.

The transition to dialysis has been difficult. As a retiree, Mauricio can barely cover out of pocket costs. The cross-town bus route he relies on for his multiple weekly appointments is unpredictable and he’s missed at least one treatment session. His English is sufficient, but sometimes he misses important details from his doctors.

Mauricio is unable to heed warnings to evacuate in anticipation of the incoming hurricane – his financial situation won’t allow it. His care team had planned for at-home dialysis treatment given the inclement weather, but the severity of the storm surge has rendered roads impassable. Mauricio can’t get to the dialysis center and homecare nurses cannot reach his home.

After two days, the worst of the hurricane has passed, but Mauricio is still homebound. His symptoms are worsening. He is extremely fatigued, nauseous, and confused. He continues calling 9-1-1.

The diabetes mortality rate among Hispanics in Houston, Texas is 24 per 100,000 as compared to the white mortality rate of 18 per 100,000.

**Economic and social drivers of health elevate Mauricio’s risk profile…**

**…this risk is compounded by environmental drivers of health…**

**….and contributes to observable differences in health outcomes**

---

1) Houston Public Media; 2) All Transit Metrics; 3) U.S. Census Bureau; 4,5) FEMA National Risk Index; 6) U.S. New & World Report; 7) Houston State of Health

*This number varies depending on proximity to coastline*
Ana is a 28-year-old, Black woman living in Bronx County, New York, who is expecting her first child. She lives with her family in a small, one-bedroom apartment in the South Bronx within a densely populated New York City Housing Authority community. Ana works in retail, and while she enjoys her job, her employer doesn’t cover medical benefits for comprehensive prenatal care.

Ana has experienced few problems during her pregnancy, but lately she has been feeling a wave of stress. Her income from her retail job isn’t enough to cover adequate medical care. She’s worried that this financial stress will only compound with the added cost of providing for her child.

Like many areas in the city, Ana’s neighborhood is considered an urban heat island – an area that experiences extreme temperature hikes, especially during summer months. Ana’s unit does not have air conditioning, and the extreme heat is causing increased discomfort, headaches, and nausea as she nears full term.

Extreme heat like Ana is experiencing is associated with several health complications such as cardiovascular disease, respiratory complications, and, for pregnant people, increased risk for pre-term birth. Without guidance from a prenatal care provider, Ana is unaware of this risk.

The pre-term birth rate for Black women in Bronx County is 13.0%, compared to 7.6% for white women.

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<thead>
<tr>
<th>Economic and social drivers of health elevate Ana’s risk profile…</th>
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<tr>
<td>…this risk is compounded by environmental drivers of health…</td>
</tr>
<tr>
<td>…and contributes to observable differences in health outcomes</td>
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**Bronx County, NY**

| % Black Pop. in Poverty | 26% |
| % Black Less than High School Degree | 21% |
| Inadequate Prenatal Care | 23% |
| Population Density | 3rd highest in U.S. |
| Extreme Heat Days | 21 per year |
| % No Air Conditioning | 30% |

---

1, 2, 4) United States Census Bureau, 2020; 3, 7) March of Dimes; 5) CDC; 6) NYC.gov, Note: as reported in South Bronx.
Edie’s Journey | Climate Impacts on Mental Health

Edie is an 80-year-old, white woman living in East Appalachia. A widow, Edie is fiercely independent and generally healthy – but has recently begun to struggle with the process of aging in place. Mobility has become a challenge and her doctor has suggested that she has begun to experience early signs of dementia.

Edie lives in a rural community without much health care infrastructure. She hesitates to drive these days, so she either foregoes routine preventative care or relies on her neighbor to help her make the trip. She has considered an assisted living facility, but she can’t afford the dues.

Edie’s home, like many in her region, is dilapidated and does not have air conditioning. This hasn’t been a problem in the past, but summer heat waves have increased in frequency over recent years. When she can get a ride, she’ll find relief in the community center A/C, but she doesn’t want to bother folks.

The combination of Edie’s old age and prescribed medications mean her body less equipped to thermoregulate. Edie’s dementia also exacerbates the situation, impacting her ability to avoid heat exposure and wear appropriate attire. Her situation leads to significant decline in mental health.

The average resident in Appalachia reports feeling mentally unhealthy 14% more days than the average American.

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1,3,4) U.S. News and World Report 5) County Health Rankings. Note: “Severe housing problems” includes issues such as overcrowding, lack of plumbing, etc. 2,6) American Psychiatric Association
Appendix II: Health Care Decarbonization Strategies
Health care organizations can reduce their emissions footprint through these common decarbonization strategies

**ENERGY EFFICIENCY**

Design infrastructure and facility footprint to optimize for resource efficiency and introduce green, energy-efficient tech into operations

- green building technology, all-electric building construction, HVAC system and lighting modifications

**RENEWABLE ENERGY**

Power operations through renewable energy sources through on-site energy generation or green purchase power agreements

- on-site electric microgrids or solar panels, green purchase power agreements

**SUPPLY CHAIN OPTIMIZATION**

Reduce reliance on disposable and single-use supplies and incorporate local, sustainable, and circular principles in procurement

- supplier sustainability scorecards, procurement from community-based agriculture, food waste reduction strategies

**CLINICAL INNOVATION**

Improve overall system effectiveness, eliminate unnecessary care, support preventative care, and introduce new processes that limit the volume and toxicity of waste

- reduced single-use items, lean principles in clinical workflows, on-site waste treatment, prevention efforts

**LOW-CARBON MEDICINES**

Substitute high-emission products with more climate friendly alternatives, and incentivize the production of climate-smart medication

- low fresh gas flows, regional anesthesia techniques, alternative medicine delivery mechanisms, green R&D and chemistry

**TRANSPORTATION EFFICIENCY**

Limit transportation-related emissions via zero-emission fleets, active travel and public transport, and hybrid health care strategies

- telehealth / remote patient monitoring, hybrid work models, incentives for use of public transit or active travel, zero-emissions fleets for sales representatives

Note: Decarbonization strategies informed by [EPA GHG Reduction Programs and Strategies](https://www.epa.gov/clean-energy).
### Example Health Ecosystem Decarbonization Strategies (1 of 2)

<table>
<thead>
<tr>
<th>EXAMPLE DECARBONIZATION STRATEGIES</th>
<th>PROVIDERS</th>
<th>PHARMA &amp; MED TECH</th>
<th>PLANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Convert waste to energy: Use on-site medical and pharmaceutical waste to create thermal energy and power operations</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>• Recycle waste: Implement circular economy principles to reduce the volume and toxicity of wastewater and solid waste (plastic, food, medical, &amp; pharmaceutical waste)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>• Reduce redundant processes: Eliminate or disincentivize inefficient operating room procedures (e.g., over-prescribing / over-treating, medical error, low-value care, or manufacturing processes)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>• Streamline point-of-care materials: Evaluate the sterilization, use, and disposal of materials in the health care setting (e.g., surgical kits) to understand potential waste</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Treat hazardous waste locally: Utilize onsite waste technologies that can convert regulated medical waste into sterile garbage that limits the need for third party hauling and disposal</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>• Design sustainable and reusable medical products: Eliminate single-use medical devices and eliminate single-use plastics in drug distribution</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>• Transition to lower-emission medical products: Substitute inhalers and other products with zero-emission alternatives, and introduce abatement technology into production</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>• Manage refrigerant use: Minimize use and manage leaks and disposal of chloro-fluorocarbons used in cold chain storage and manufacturing processes</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>• Manage anesthetic gases: Minimize fresh gas flow rates and decommission or avoid construction of central nitrous oxide piping that is more prone to leakage</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enable virtual and digital care delivery: Incentivize and increase access to virtual appointments and remote diagnostics and chronic care management</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>• Incentivize sustainable travel and transport: Encourage employees to participate in forms of active travel and public transport to reduce community-related emissions</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

Sources: AHRQ, Health Care Without Harm, Deloitte, Mazzetti, Pathways to Net Zero

Note: Sector alignment is illustrative; decarbonization strategies should be considered based on the emission sources and needs of a specific organization.
## Example Health Ecosystem Decarbonization Strategies (2 of 2)

<table>
<thead>
<tr>
<th>EXAMPLE DECARBONIZATION STRATEGIES</th>
<th>PROVIDERS</th>
<th>PHARMA &amp; MED TECH</th>
<th>PLANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Implement hybrid work models: Implement elements of remote or hybrid work models that reduce business travel and commuting and reduce the need for physical footprint</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Offer community-based care sites: Support the proliferation of community-based care and community health worker models to reduce or eliminate emissions-intensive travel and transport</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>• Transition to low-emission fleets: Transition to electrified fleets (e.g., for sales representatives, ambulances, etc.) to reduce direct emissions and pollution in communities of operation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Incentivize suppliers to reduce footprint: Implement preferential purchasing with suppliers that perform disclosures and have science-based targets for decarbonization</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Localize supply chains: Localize supply chains and re-shore certain capabilities (where appropriate) to limit distribution-related emissions across supply chain</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Offer sustainably-sourced food: Provide healthy, locally-produced, and plant-forward menu and retail options, and support climate-resilient agriculture</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Procure sustainable and reusable products: Eliminate single-use medical devices and eliminate single-use plastics in drug distribution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Consider purchase power agreements: Access clean energy sources by purchasing a system’s clean electric output for a predetermined period at a fixed rate</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Transition to zero carbon fuel sources: Power facilities and offices with 100% clean, renewable electricity, and implement fuel switching where electrification is not possible</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Meet green building/retrofitting standards: Deploy lower-emission construction processes and promote energy efficiency through retrofit projects and adherence to energy standards</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>• Optimize energy use: Reduce building energy consumption via retro- and continuous commissioning, lighting modifications, supplemental load reduction for HVAC systems, etc.</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Sources: AHRQ, Health Care Without Harm, Deloitte, Mozzetti, Pathways to Net Zero
Note: Sector alignment is illustrative; decarbonization strategies should be considered based on the emission sources and needs of a specific organization.
Decarbonization strategies can be prioritized via a set of clear criteria

Aligning on a prioritization criteria, and how to weight each criteria, will require strategic alignment across functions

### Example Prioritization Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Initiative 1</th>
<th>Initiative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abatement Potential</td>
<td>High; 29,500 MTCO2e</td>
<td>Low; 6,700 MTCO2e</td>
</tr>
<tr>
<td>Business Value</td>
<td>Medium</td>
<td>Medium-High</td>
</tr>
<tr>
<td>Feasibility</td>
<td>High; $26.4M and 2 years</td>
<td>Low; $6.8M and 1 year</td>
</tr>
<tr>
<td>Quality Impacts</td>
<td>High-Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Health Equity &amp; Justice</td>
<td>Low-Medium</td>
<td>High</td>
</tr>
</tbody>
</table>

### Example Scenario*

Consider two abatement strategies that a company may choose to pursue:

- **Initiative 1**: Transition to net-zero suppliers
- **Initiative 2**: Implement a hybrid working model

*Scenario is illustrative; abatement potential, business value, feasibility, and quality / equity impacts will vary based on initiative specifics

---

*Note: MTCO2e stands for million metric tons of carbon dioxide equivalent.*
Appendix III: Supplemental Definitions
## Key Terms

<table>
<thead>
<tr>
<th>Key Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abatement</td>
<td>Also known as mitigation or emissions reduction; refers to reducing the degree or intensity of, or eliminating, emissions (EPA)</td>
</tr>
<tr>
<td>Carbon dioxide equivalent (CO₂e)</td>
<td>Universal unit of measurement to indicate the global warming potential (GWP) of GHGs, expressed as the GWP of a unit of CO₂ (GHG Protocol)</td>
</tr>
<tr>
<td>Circular economy</td>
<td>An economy that involves processes that are restorative/regenerative by design, eliminate waste, and maintain resource quality over time (EPA)</td>
</tr>
<tr>
<td>Climate change</td>
<td>Any significant change in the measures of climate lasting for an extended period of time (e.g., temperature, precipitation, wind patterns) (EPA)</td>
</tr>
<tr>
<td>Decarbonization</td>
<td>The process by which countries, individuals or other entities aim to achieve zero fossil carbon existence. Typically refers to a reduction of the carbon emissions associated with electricity, industry and transport (IPCC)</td>
</tr>
<tr>
<td>ESG</td>
<td>Environmental, Social, and Governance; a set of standards for a company’s operations. As overseers of risk and stewards of long-term enterprise value, board members have a vital oversight role in assessing the organization’s environmental and social impacts (Harvard Law School)</td>
</tr>
<tr>
<td>Emissions</td>
<td>The release of GHG into the atmosphere (GHG Protocol)</td>
</tr>
<tr>
<td>Fossil fuels</td>
<td>A general term for organic materials formed from decayed plants and animals that have been converted to oil, coal, or natural gas (EPA)</td>
</tr>
<tr>
<td>Global warming potential</td>
<td>A factor describing the degree of harm to the atmosphere of one unit of a given GHG relative to one unit of CO₂ (GHG Protocol)</td>
</tr>
<tr>
<td>Greenhouse gas (GHG)</td>
<td>Any gas that absorbs infrared radiation in the atmosphere. Includes, carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (EPA)</td>
</tr>
<tr>
<td>Health equity</td>
<td>The fair and just opportunity for every individual to achieve their full potential in all aspects of health and well-being (Deloitte)</td>
</tr>
<tr>
<td>Inflation Reduction Act</td>
<td>Provides tax credits for consumers and businesses to lower energy consumption and GHG emissions (EPA)</td>
</tr>
<tr>
<td>Materiality</td>
<td>Information likely to have been viewed by a reasonable investor as having significantly altered the ‘total mix’ of available information (SEC)</td>
</tr>
<tr>
<td>Net zero</td>
<td>A state in which the GHGs going into the atmosphere are balanced by removal out of the atmosphere (Net Zero Climate)</td>
</tr>
<tr>
<td>Resilience</td>
<td>Ability to prepare, respond, and recover from multi-hazard threats with minimum damage to well-being, economies, and environments (EPA)</td>
</tr>
<tr>
<td>Science-based target</td>
<td>A clearly-defined pathway for companies to reduce GHG emissions; targets are considered ‘science-based’ if they are in line with what is necessary to meet the goals of the Paris Agreement – limiting global warming to well-below 2°C above pre-industrial levels (SBTi)</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Meeting the needs of the present without compromising the ability of future generations to meet their own needs (UN)</td>
</tr>
</tbody>
</table>
Appendix IV: Note from the Authors & Acknowledgements
About the Authors

The creation of this action guide was a collaborative effort from the Black Directors Health Equity Agenda (BDHEA), Deloitte, and the Commonwealth Fund

The Black Directors Health Equity Agenda (BDHEA) is a network of Black board directors and senior leaders who use their convening power to unite stakeholders and shift thinking to advance health equity throughout the health ecosystem. Their growing network of health care leaders blend deep national and local health care expertise, understanding of structural racism and health inequities, and lived experiences to make positive change for all communities.

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This resource is dedicated to the memory of our esteemed colleague, Hilary Hamilton, whose valuable contributions and unwavering commitment to the field of sustainability and climate resilience will continue to inspire us.
Contact Us

Want to act on topics discussed in this Action Guide? Need help?

We can help orient users to the Action Guide, problem-solve, and think through next steps to take.

Have suggestions for how to improve this Action Guide?

Send us your thoughts on how to improve this version of the Action Guide and on what you’d like to see next.

Have a story, example, or resource to share with the development team?

Help us continue amplifying the topics of decarbonization and health equity and by sharing your learnings with us.

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