REPUBLIC OF KENYA

MINISTRY OF HEALTH

KENYA GREEN HEALTH GUIDELINES

Towards low-carbon, climate-resilient, and sustainable health systems

Safe for patients, workers, communities, and the environment

Publication Date

June 2026

Disclaimer

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KENYA GREEN HEALTH GUIDELINES

"Practical actions for low-carbon and climate-resilient health systems in Kenya"

Table of Contents

Foreword ..... (iii)

Preface ..... (iv)

Acknowledgements ..... (v)

List of Abbreviations ..... (vi)

Executive summary ..... (viii)

The Guidelines' development journey ..... (ix)

CONTEXT & RATIONALE 1

KEY AREAS OF INTERVENTION:

- Leadership & Governance 7
- Energy Management 15
- Water Management 19
- Waste Management 24
- Procurement 27
- Food Services 33
- Green Building 37
- Transportation 41
- Digital Health 46

IMPLEMENTATION ROADMAP 49

MONITORING & REPORTING FRAMEWORK 59

Bibliography 65

Annexes 67

Foreword

Climate change stands as one of the defining crises of our time, with profound implications for health systems and population well-being. In response, and in full alignment with the **Kenya Climate Change and Health Strategy 2024–2029** and the **Kenya Health Act, 2017**, the Ministry of Health has prioritised the integration of sustainability principles into healthcare planning and service delivery. Specifically, the Health Act and the Public Health Act mandate the health sector to address environmental risk factors that contribute to disease, while at the same time empowering the Cabinet Secretary to issue regulations and guidelines for the effective implementation of the Acts.

It is against this backdrop that the **Kenya Green Health Guidelines** were developed, representing a landmark milestone in this journey. They offer practical, evidence-based direction to health facilities and professionals, enabling them to reduce the environmental footprint of healthcare - from energy use and waste management to sustainable procurement - while safeguarding public health. This dual commitment ensures that our health sector not only heals people but also protects the environment that sustains life.

Developed through a broad-based, multisectoral collaboration involving experts, institutions, and stakeholders, the guidelines reflect deep technical insight and on-the-ground realities. Their design ensures they are both robust and adaptable, responsive to the diverse contexts of Kenya's health system - from referral hospitals to community clinics - thus enabling measurable progress in reducing emissions, conserving resources, and minimising pollution without compromising quality of care.

I commend all those who contributed to this critical initiative and strongly encourage healthcare institutions across the country to adopt and operationalize these guidelines. Through collective action, we can advance a more resilient, sustainable, and health-promoting system for all Kenyans.

The **Kenya Green Health Platform (KGHP),** launched alongside these guidelines, will catalyse collective action to advance a low-carbon, more resilient, and health-promoting system for all Kenyans.

Together, let us build a healthcare system that heals without harm one that protects both people and planet, and secures a healthier, greener future for generations to come.

Hon. Aden Duale, EGH
Cabinet Secretary,
Ministry of Health, Republic of Kenya

Preface

The Ministry of Health recognizes the critical intersection between environmental sustainability and the provision of quality healthcare services. The development of the **Kenya Green Health Guidelines** is a testament to our commitment to building a resilient and environmentally responsible health sector.

These guidelines provide practical direction on integrating sustainable practices into healthcare operations, including resource management, waste reduction, and climate-responsive service delivery. They are informed by extensive technical consultation, research, and collaboration with national and international partners.

These guidelines will serve as a reference for policymakers, facility managers, and healthcare professionals, supporting the Ministry's broader vision of a health system that protects both human health and the environment.

The Ministry acknowledges the dedicated efforts of all individuals and organisations involved in this process, whose expertise and guidance have been instrumental in shaping a comprehensive and actionable document.

Ultimately, the Green Health Guidelines represent more than a policy framework, they are a call to action. By embracing and implementing them, through the **Kenya Green Health Platform**, we will move collectively toward a health sector that is resilient, resource conscious and aligned with Kenya's National Determined Contributions (NDCs) and other global commitments to sustainability.

Mary Muthoni Muriuki, CBS

Principal Secretary for Public Health and Professional Standards,
Ministry of Health, Republic of Kenya

Acknowledgements

The **Kenya Green Health Guidelines** were developed as part of the health sector's response to the growing impacts of climate change on health. The Guidelines development was made possible through the commitment and collaboration of numerous institutions and experts.

The Ministry of Health expresses its sincere appreciation to the Secretary Administration, Mr. Adan G. Harakhe, HSC, the Director of the Directorate of Public Health and Sanitation, Dr. Stephen Muleshe and Dr. Grace Ikahu – Muchangi, immediate Acting Director, Directorate of Public Health and Sanitation, for their visionary leadership and invaluable strategic guidance throughout the development of these guidelines.

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Additionally, special appreciation is extended to the Taskforce Committee members (annexed) and the Climate Change and Health Technical Working Group, whose collaborative efforts and critical contributions were essential to the successful completion of this document. The integration of these administrative and technical leadership roles ensures that the Ministry maintains a cohesive approach to health policy, aligning with the broader national goals of Universal Health Coverage and the Bottom-Up Economic Transformation Agenda (BETA). This structured coordination is vital for the effective implementation of health reforms, including the digitization of health systems and the enhancement of public health standards across the country.

The Ministry further extend special appreciation to the Netherlands Ministry of Health, Welfare and Sports for their financial and strategic support through the Global Health Partnership Programme (GHPP). We particularly recognize the valuable contributions of Geoffrey Korir (Embassy of the Kingdom of the Netherlands in Kenya) and Eva Legtenberg (Ministry of Health, Sports and Welfare, The Hague), whose engagement and guidance were instrumental in making the development of these guidelines a reality.

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Additionally, the Ministry recognizes the Consultants, Arch. Nickson Otieno and Esther Ishuga (both from NIKO GREEN), and Gladys Ngeno, whose technical expertise, advisory support, and commitment were instrumental in shaping the content and structure of this document.

Finally, the Ministry acknowledges the valuable contributions from key departments, semi-autonomous agencies and other health-determining sectors, and all stakeholders (annexed); their technical inputs helped shape these guidelines.

Dr Patrick Amoth, CBS

Director General for Health, Ministry of Health, Republic of Kenya

List of abbreviations

Abbreviation	Full Form
AKI	Association of Kenya Insurers
APHOK	Association of Public Health Officers of Kenya
APHRC	Africa Population Health Research Centre
ARIN	Africa Research Impact Network
AU	African Union
CHAK	Christian Health Association of Kenya
CHMTs	County Healthcare Management Teams
CHV	Community Health Volunteers
CIPDs	County Integrated Development Plans
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CoG	Council of Governors
CFCs	Chlorofluorocarbons
CPD	Continuing Professional Development
DCM	Dichloromethane
DEHP	Di(2-ethylhexyl) phthalate
DHA	Digital Health Agency
$DHIS_2$	District Health Information Software 2
DINCH	Di(isononyl) cyclohexane-1,2-dicarboxylate
DMRV	Digital Measurement, Reporting, and Verification
DTT	Dithiothreitol
EAC	East African Community
ECAW	Electrochemically Activated Water
EDGE	Excellence in Design for Greater Efficiency

Abbreviation	Full form
EPRA	Energy and Petroleum Regulation Authority
EPC	Energy Performance Contracts
ESG	Environmental, Social, and Governance
EVA	Ethylene-vinyl acetate
FGF	Fresh Gas Flows
FHIR	Fast Healthcare Interoperability Resources
GEF	Global Environment Facility
GGHH	Global Green and Healthy Hospitals
GHG	Greenhouse Gases
GWP	Global Warming Potential
HL7	Health Level Seven International
HIS	Health Information System
HVAC	Heating, Ventilation, and Air Conditioning
ICT	Information and Communication Technology
IFC	International Finance Corporation
IRR	Internal Rate of Return
ISO	International Organisation for Standardisation
ISO/TS	International Organisation for Standardisation / Technical Specification
JMP	Joint Monitoring Programme
KAPI	Kenya Association of Pharmaceutical Industry
KEHPHPU	Kenya Environmental Health Practitioners' and Public Health Professionals Union
KEMRI	Kenya Medical Research Institution
KEMSA	Kenya Medical Supplies Agency
KHF	Kenya Healthcare Federation

List of Abbreviations

Abbreviation	Full form
KGHP	Kenya Green Health Platform
KMA	Kenya Medical Association
KMLTTB	Kenya Medical Laboratory Technicians and Technologists Board
KMTC	Kenya Medical Training College
KPIs	Key Performance Indicators
KS	Kenyan Standards
KUTRRH	Kenyatta University Teaching Referral and Research Hospital
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LPG	Liquefied Petroleum Gas
MEDS	Mission for Essential Drugs & Supplies
MoH	Ministry of Health
MTRH	Moi Teaching and Referral Hospital
MtCO2	Metric Tons of Carbon Dioxide
MWTM	Medical Waste Treatment Machine
NDCs	Nationally Determined Contributions
NEMA	National Environment Management Authority
NO2	Nitrogen Dioxide
NPV	Net Present Value
OECD	Organisation for Economic Co-operation and Development
PPA	Power Purchase Agreement
PPE	Personal Protective Equipment
PV	Photovoltaic
PVC	Polyvinyl Chloride
RACI	Responsible, Accountable, Consulted, and Informed

Abbreviation	Full form
RIVM	National Institute for Public Health and the Environment
ROI	Return on Investment
RUPHA	Rural & Urban Private Hospitals Association
SDGs	Sustainable Development Goals
SHIF	Sustainable Healthcare Infrastructure Forum
SPP	Sustainable Procurement Policy
SOPs	Standard Operating Procedures
SusQI	Sustainable Quality Improvement
SWM	Solid Waste Management
TCO	Total Cost of Ownership
TCEP	Tris(2-carboxyethyl) phosphine TCEP
THF	Tetrahydrofuran
TVETs	Technical and Vocational Education Training
UHC	Universal Health Coverage
UK-PACT	United Kingdom Partnering for Accelerated Climate Transition
WASH	Water Sanitation and Hygiene
WASH FIT	Water and Sanitation for Health Facility Improvement Tool
WHO	World Health Organisation
WHO-HCWH	World Health Organisation – Health Care Without Harm

Executive Summary

Healthcare delivery often generates significant unintended negative environmental impacts. A health system that heals people while damaging the environment that sustains them is not sustainable. A greener health sector lowers emissions, builds climate resilience, and improves patient outcomes. Green facilities are essential to delivering quality, accessible, and affordable care, making them a key element of Universal Health Coverage (UHC).

The Government of Kenya is implementing measures aimed at strengthening a low-carbon, climate-resilient, and environmentally sustainable health system. The **Kenya Green Health Guidelines** provide a policy and operational framework to guide health facilities and sector actors in reducing environmental footprint, improving resource efficiency, enhancing climate resilience, and promoting sustainable service delivery.

The Guidelines recommend greening interventions in nine domains: policy and leadership, green procurement, energy efficiency, sustainable waste management, water conservation, green building, sustainable transportation, food services, and digitisation. These interventions are aligned with the Kenya Climate Change and Health Strategy 2024–2029, which sets out the national strategic direction for climate action within the health sector.

An implementation roadmap outlines short-, medium-, and long-term strategies for integrating these interventions at national, county, and facility levels. Effective coordination and advocacy are essential for success, supported by strong monitoring and reporting systems that leverage institutional data, key performance indicators, external oversight, and technology.

Purpose

Guide national, county, and facility actions to green healthcare while enhancing resilience and quality of care.

Content

The Guidelines provide policy direction, sector-specific interventions, tools, and case studies for greening Kenya's health systems.

Implementation Approach

Phased implementation strategy (short, medium, and long term) supported by strong coordination, advocacy, and robust monitoring & reporting frameworks.

Target Outcome:

Low-Carbon, Climate-Resilient Health System

The Guidelines' Development Journey

The Kenya Green Health Guidelines have been developed through a robust evidence-based and participatory process, as highlighted below:

- The draft outline of the guidelines was presented during the 2nd Climate Change and Health Conference in Kenya in October 2024
- A **baseline situation analysis** was conducted from December 2024 to August 2025 aimed at identifying key carbon emission hotspots, simulating their associated emissions, and recommending decarbonization actions to be incorporated in the guidelines. The study involved primary data collection in 100 facilities in 10 counties across the country.
- A **Stakeholders Forum** was held on 6th August 2025 at Sarova Panafric Hotel to present the draft Green Healthcare Guidelines and the **Situational Analysis of Kenya's Healthcare Carbon Footprint**. Stakeholders endorsed the situational analysis as a baseline, provided substantive feedback, and agreed on priority areas for the guidelines.
- A **Technical Retreat for Public Sector Stakeholders** was held from 1st - 4th December 2025 at Ole Ken Hotel. It provided an intensive platform for state actors to review the draft guidelines, provide feedback, and agree on an implementation framework.
- A **Stakeholder Workshop for Non-State Actors** including the private sector, academia, professional associations, and development partners, was held on 11th December 2025 at Sarova Panafric Hotel in Nairobi.
- **Pre-testing and Sensitization Forums for County Healthcare Management Teams (CHMTs)** were held in three Counties (Makueni, Nairobi, and Nyandarua) on 5th, 16th , and 30th March 2026, respectively.
- **Final National Stakeholder Validation Forum** on 19th March 2026.

Context and Rationale

Introduction to Greening Healthcare

Health and the Carbon Challenge

Global Impact

5%

Contribution of healthcare to global net emissions (equivalent to aviation/shipping).

National Carbon Footprint Reduction

32%

Kenya is committed via Nationally Determined Contributions (NDCs) to 32% greenhouse gas (GHG) reduction by 2030

Net Zero Healthcare Target

2030

Kenya pledged at COP26 to develop a net-zero emissions healthcare system by 2030.

Why Green Healthcare?

- Improves public health outcomes
- Reduces facility operating costs
- Strengthens climate resilience
- Aligns with SDGs 3, 12, & 13

Healthcare contributes close to 5% of worldwide carbon dioxide emissions. Healthcare facilities emit GHGs directly through energy consumption and transportation. Indirect emissions occur across the supply chain, from goods production to staff and patient travel.

The healthcare sector aims to prevent and treat ailments, adhering to the Hippocratic oath's principle of “do no harm.” However, the healthcare industry can inadvertently jeopardize health, as the sector consumes vast quantities of energy, water, and materials while generating substantial waste and carbon emissions. As climate change accelerates, immediate and decisive action is crucial to avert and adapt to its escalating health ramifications, and transition to sustainable sustainable health systems.

According to WHO, sustainable health systems “improve, maintain or restore health, while minimising negative impacts on the environment and leveraging opportunities to restore and improve it, to the benefit of the health and well-being of current and future generations.”

Kenya’s Devolution Context

Kenya’s healthcare is devolved across 47 counties with varying facility levels (2-6). This diversity requires tailored green solutions.

LEVEL 6	**National Referral**
LEVEL 4-5	**County Referral**
LEVEL 2-3	**Primary Care**

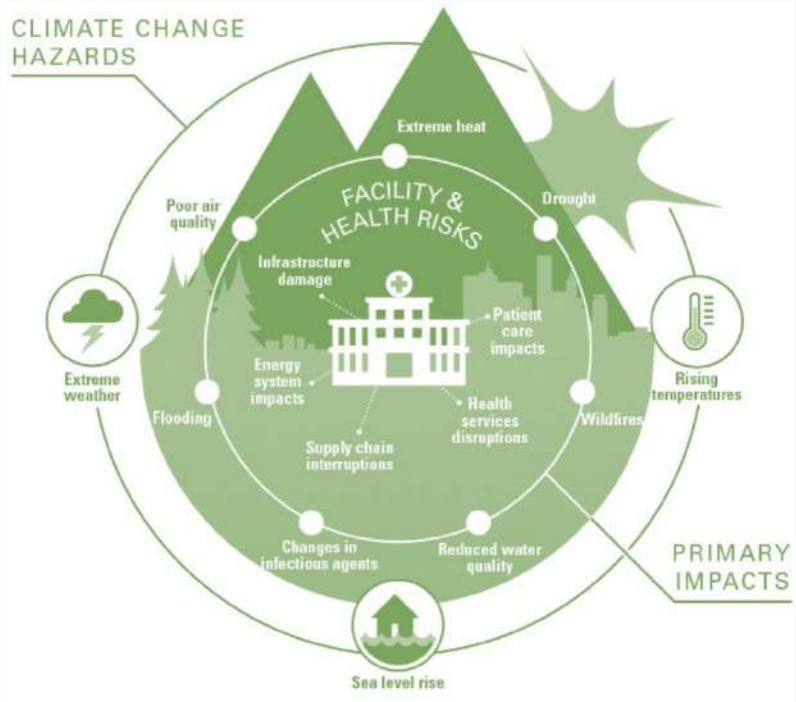
This diversity creates wide variation in energy use, waste management, and resource consumption.

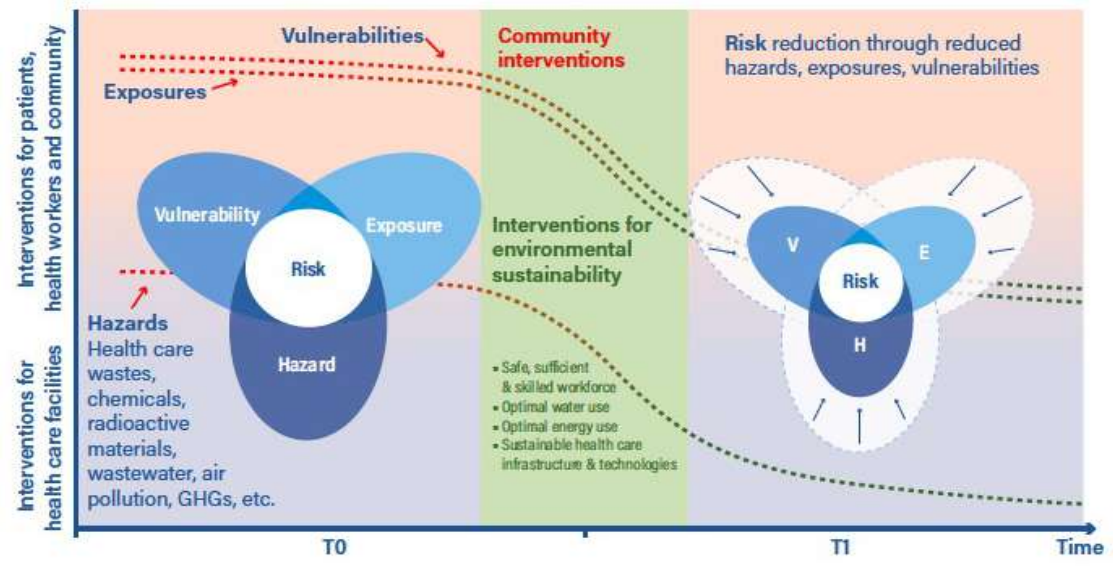
Climate and Health Risks

> ***"Climate change is the single biggest health risk facing humanity."***
>
> World Health Organisation, 2023

Heat waves, wildfire smoke, floods, and extreme weather events disproportionately impact vulnerable Kenyan residents and facility operations.

The figure below shows climate related hazards and their impacts on healthcare delivery





Source: WHO, 2020

This Guide is practical primer to start and scale environmental stewardship toward climate resilience and net-zero emissions.

Policy, Legal and International Framework

Global Framework

International Commitments

Paris Agreement (2015) Climate Action

Nationally Determined Contributions (NDCs) focusing on emission reductions and adaptation. Kenya commits (via NDCs) to 32% and 35% GHG reduction by 2030 and 2035, respectively, including health sector measures.

Climate-Health Systems

WHO Global Strategy on Health, Environment and Climate Change (2020)
Operational Framework for building climate-resilient and low-carbon health systems.

WHO Operational framework for Climate Resilient and Low Carbon Health Systems (2030)

Practical guidance for health systems to mitigate climate risk and reduce emissions.

2021 Conference of Parties (COP26) Climate Change and Health Commitments.

Kenya committed to 'Low-carbon, climate resilient health systems by 2030.

WHO Sustainable Health Systems Framework (2017)

Provides benchmarks for low-carbon, climate-resilient health systems.

Regional Framework

African Union & East African Community

Strategic Vision

AU Agenda (2063)
"The Africa We Want" - Pan-African blueprint integrating climate action into social/economic transformation

Regional Climate Strategy

AU Climate Strategy (2020 – 2030)

Continental adaptation/mitigation framework, including health

Health & Environment

Libreville Declaration on Health and Environment (2008)

Health and Environment in Africa; linkage for policy coherence.

EAC Climate Change and Policy Strategy (2010)
East African Community Climate Change Policy aiming for regional adaptation.

National Framework

Kenyan Legislation

Legal Foundation

Constitution of Kenya (2010)

Article 42 (Right to Clean Environment) & Article 69 (Sustainable Exploitation).

Development and Healthcare

Kenya Vision 2030

Long-term plan integrating sustainability, prioritises equity & efficiency in healthcare delivery.

Health Act (2017) and the Public Health Act
mandate the health sector to address environmental risk factors that contribute to disease.

Climate-Health nexus

Kenya Climate Change & Health Strategy (2024–2029)

Roadmap for climate-resilient, low-carbon health systems.

Other legislative & regulatory frameworks

Several other acts include: National Anaesthesia Guidelines (2016), National Guidelines on Safe Management of Healthcare Waste (2023), Sustainable Waste Management Act (2022), Integrated National Transport Policy (2024), Energy Management Regulations (2025), Kenya's Buildings & Construction Decarbonization Roadmap

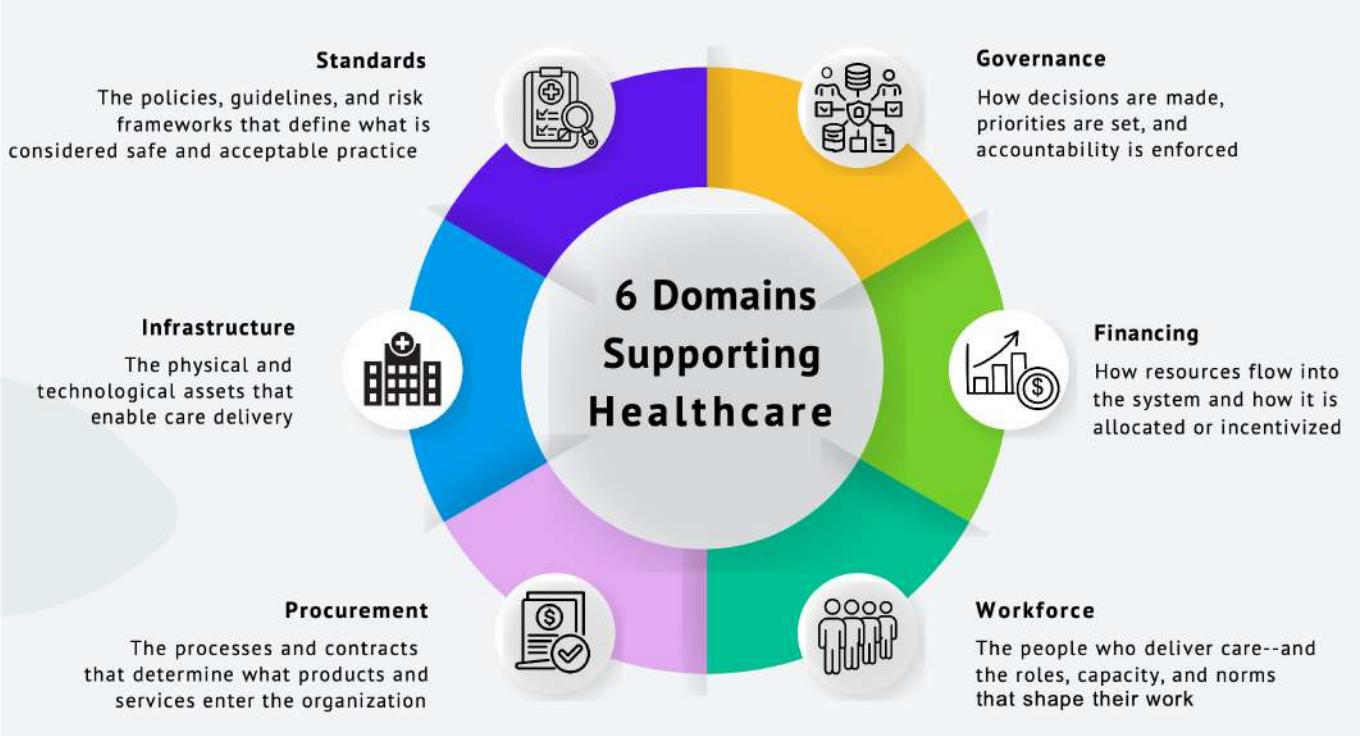
What is Green Healthcare?

Greening healthcare refers to the *integration of sustainable practices into healthcare operations to reduce environmental impact while maintaining or improving patient care quality.*

The health sector plays a vital role in promoting human well-being, yet it also contributes significantly to environmental degradation through intensive energy consumption, resource use, and waste generation.

Greening healthcare is essential for aligning the mission of health promotion with environmental responsibility.

By adopting sustainable practices, healthcare institutions can reduce their ecological footprint, improve operational efficiency, and contribute to a healthier planet for future generations.



9 Pillars of Green Healthcare

This comprehensive guide integrates actionable strategies across nine key operational areas to create a holistic sustainable healthcare ecosystem.

Leadership & Governance
Demonstrate leadership support to create organisational culture change and widespread .community engagement.

Green Building & Infrastructure management
Design strategies for climate resilience, biodiversity, and health co-benefits.

Energy Management
Measures to reduce consumption and transition to renewable energy sources.

Green Procurement & Supply chain management
Strategies for environmentally preferable purchasing and total asset lifecycle management.

Waste Management
Circular economy in healthcare through waste prevention, reduction, reuse, and recycling strategies.

Green Health

Digital Healthcare
Leveraging digital technology for healthcare decarbonization.

Water Management
Aspirational framework for achieving complete water independence on-site.

Transportation
Reducing travel-related emissions for facility fleets and daily commuters.

Food Services
Sustainable food sourcing, healthy menus, and comprehensive waste reduction.

Leadership & Governance

A systematic path to building green healthcare ecosystems

Key Intervention Area 1

Leading a green healthcare transition

Effective policy and evidence-informed leadership at all levels is needed to ensure that environmental health and sustainability principles are embedded within healthcare spearheaded by the Ministry of Health and cascaded to county and facility levels.

National level

a. Review and align health sector policies and standards with sustainability and low-carbon and climate-resilient healthcare goals.
b. Operationalize the **Kenya Green Health Platform (KGHP)** to coordinate cross-sectoral efforts.
c. Integrate sustainability into all **pre-service and in-service health training** curricula.
d. Strengthen applied **research and innovation** through TVETs, universities, and professional institutions.
e. Establish dedicated national budget provisions for sustainability and facilitate access to **climate and green financing** referenced to the treasury's climate finance guidance
f. Promote national advocacy and recognition mechanisms, such as a national **Green Healthcare Awards**, to incentivize best practices.
g. Establish a **Green Health Certification Scheme** for health commodities, facilities, and professionals

County level

a. Localise national climate and health policies and decarbonization targets into County Integrated Development Plans (CIDPs), County Health Strategic Plans, and budgets.
b. Build capacity of county teams and facility managers on sustainable healthcare planning, costing, and monitoring.
c. Allocate county-level resources and mobilise partnerships to finance sustainability initiatives.
d. Incorporate sustainability performance indicators into county supervision, monitoring, and reporting systems.

Facility & community level

a. Form a facility-level **Green Team** to coordinate implementation and reporting.
b. Conduct baseline assessments to \determine environmental and resource use patterns.
c. Develop and operationalize costed sustainability plans aligned with facility work plans and county priorities.
d. Implement practical measures for energy, water, waste, and procurement efficiency.
e. Participate in peer learning and continuous quality improvement initiatives on sustainable healthcare.
f. Community engagement, involvement and capacity building in health
g. Building capacity of **community health promoters (**CHPs) to **green households**.

Leading a green healthcare transition

1

Initiate Action

Adopt a formal Board resolution on environmental stewardship.

2

Identify People

Appoint an Executive Sponsor and internal site champions.

3

Earmark Funds

Allocate budget and leverage utility incentives & savings.

4

Build Plans

Embed specific goals into strategic and operational plans.

5

Identify Partners

Engage Experts, Coalitions, utilities, and vendors.

6

Pick Projects

Prioritise high-impact, quick-win initiatives across depts.

7

Evaluate

Use Scorecards to benchmark and track quarterly KPIs.

8

Celebrate

Share results, recognise teams, and scale success.

Tip: Start small with "low-hanging fruit" to build momentum before tackling complex infrastructure projects.

Stakeholder Engagement Model:

Integrated team structure, communication channels and responsibilities

Organisational Structure & Communication Flow

Team Responsibilities & Deliverables

Sustainability Team
- Policy development
- Certification tracking
- Data reporting

Facilities Management
- Equipment upgrades
- Preventive maintenance
- Energy monitoring

Clinical Operations
- Waste segregation
- Equipment usage
- Staff training

Support Services
- Green procurement
- Food waste management
- Cleaning protocols

Meeting Cadence

D	**Daily Huddles**	Facilities Team (15 min)
W	**Weekly Update**	Core Teams (1 hr)
M	**Steering Comm.**	Leadership (2 hrs)
Q	**Board Review**	Executive (1 hr)

Stakeholder Engagement & Responsibility:

Collaborative framework for effective implementation

Collaboration Flow

C-Suite / Leadership → Sustainability Team → Facilities Management → Department Heads → Operations Staff

Responsibility Assignment Matrix (RACI)

Stakeholder	Assessment & Planning	Quick Wins	System Optimisation	Advanced Implementation
Sustainability Team	R	C	C	R
Facilities Management	C	R	R	A
C-Suite / Leadership	A	I	I	A
IT Department	I	C	R	C
Food Services	C	R	I	C
Procurement	R	C	C	C
Operations Staff	I	R	C	I
External Partners	C	I	C	R

R Responsible: Those who do the work to complete the task

A Accountable: The one ultimately answerable for correct completion

C Consulted: Those whose opinions are sought (two-way communication)

I Informed: Those kept up-to-date on progress (one-way communication)

Stakeholder Communication Strategy: *Tailored messaging and engagement channels for key audiences*

Executives

Quarterly

Leadership & Board

Primary Focus

- ROI (215%)
- Risk Mitigation
- Market Leadership
- Cost Savings
- Compliance

Channels

- Board Reports
- Exec Dashboards
- Q-Reviews
- Briefings

Key Message

*"Our green strategy delivers **KSh. 45m annual savings** and mitigates regulatory risk, positioning us as a **market leader** with LEED Platinum status."*

Strategic Direction

Employees

Monthly

Staff & Operations

Primary Focus

- Health/Wellbeing
- Job Security
- Comfort
- Work Pride
- Training

Channels

- Town Halls
- Newsletters
- Training
- Green Champs

Key Message

*"You work in a **healthier environment** with better air quality. Join our Green Champions to build **new skills** and lead our sustainability journey."*

Operational Feedback

Customers

Continuous

Patients & Community

Primary Focus

- Safety/Quality
- Healing Space
- Community
- Environment
- Values

Channels

- Website
- Social Media
- Signage
- Brochures

Key Message

*"We're committed to your health and our planet. Our **healing spaces** are designed to be safer, cleaner, and **environmentally responsible**."*

Service Delivery

Case Studies

Real-world example of leadership for green healthcare transition

Tools & Resources

Tool/Framework	Description / Use
WHO guidance for climate-resilient and environmentally sustainable health care facilities	○ Provides a structured approach for integrating sustainability in health facility operations, including governance, resource management, and policy alignment. Useful as a guiding framework for ministries and hospital leadership.
Sustainable Quality Improvement (SusQI) Framework	○ Developed to integrate sustainability into quality improvement in healthcare. Encourages leadership to align service delivery with environmental, social, and economic dimensions.
ISO 14001: Environmental Management Systems	○ International standard for systematic environmental management that can be adopted at the hospital or ministry level to institutionalise sustainability practices and compliance.

Success story

M.P. Shah Hospital, Nairobi

- Has demonstrated strong leadership in embedding sustainability within its institutional policy framework through the Green365 Strategy, launched as part of its 2021–2025 strategic plan under the "Sustainable Growth" pillar. By elevating sustainability to a strategic priority, hospital leadership ensured that environmental stewardship is integrated into decision-making, resource allocation, and organisational culture. This policy direction reflects a deliberate commitment to address climate and environmental challenges as a health issue, aligning with the global movement for greener healthcare.

- The Green365 Strategy operationalizes leadership through specific programmes covering water conservation, energy efficiency, waste management, transport, and sustainable food services. Examples include installing water-saving devices, investing in energy-efficient infrastructure, promoting staff carpooling, and strengthening waste segregation and recycling systems.

- To drive accountability, environmental Key Performance Indicators (KPIs) have been built into the hospital's Balanced Scorecard, meaning sustainability is monitored alongside financial and clinical outcomes.

- Leadership has also invested in "green champions" across departments, tasked with coordinating and tracking progress and reinforcing behavioural change among staff. M.P. Shah Hospital demonstrates effective governance and leadership by institutionalizing sustainability through board-approved strategies, measurable targets, and leadership structures.

Sustainable Energy Management

Optimise energy performance

Key Intervention Area 2

Energy Management: *Prioritised actions to reduce energy consumption and increase efficiency*

Healthcare systems consume substantial amounts of water and energy, driven by heating, cooling, lighting, and the use of equipment. Large hospitals particularly exhibit high energy intensity, while the production of healthcare products may involve significant energy usage.

FOUNDATION
Benchmarking & Efficiency

- **Audit & Benchmark:** Conduct comprehensive energy audit and benchmark usage against industry standards.
- **Set Reduction Targets:** Establish clear goals, e.g., achieve 10% reduction in energy use from baseline over 12 months and 2% annual savings through continuous improvement.
- **Behavioural Change Programmes:** Integrate health worker training and occupant awareness to reduce consumption through daily practices.
- **Retro-Commissioning:** Undertake retro-commissioning for building systems to ensure optimal operation.
- **Purchasing Standards:** Implement policy requiring purchase of energy-efficient equipment for top 25th percentile.

OPTIMISATION
Controls & Lighting

- **Intelligent Scheduling:** Implement zone scheduling, night setbacks, and occupancy sensors for HVAC and lighting.
- **LED Upgrades:** Replace fluorescent/incandescent fixtures with LEDs; install LED exit signs and nightlights.
- **Daylight Harvesting:** Utilise natural light near exterior walls and optimise room finishes to maximise useful light levels.
- **System Resets:** Implement variable air volume temperature reset and hot water reset strategies.

ADVANCED
HVAC & Renewables

- **System Optimisation:** Add economizers, heat recovery on air handlers, and sequence controls for chillers.
- **Steam Management:** Audit and repair steam traps annually; install steam heat recovery systems.
- **Promote clean cooking:** Promote adoption of clean cooking fuels and devices in healthcare institutions and households. Support community awareness on household air pollution.
- **Invest on renewable energy:** Shift to solar, wind, or biofuels for electricity, heating, and water pumping. Replace fossil-fuel boilers with cleaner alternatives.
- **Equipment Upgrades:** Choose high-efficiency rooftop units and instantaneous water heaters.

Energy Management

Intervention Area 2

Tools & Resources

Tool/Framework	Description / Use
ISO 50001 Energy Management Standard	○ Provides a global framework for organisations to establish systems and processes to improve energy performance, including energy efficiency, use, and consumption.
Green Building Certification Systems (LEED, EDGE)	○ Benchmarks for sustainable building design and operation, including energy performance.
UNDP/GEF Energy Efficiency Toolkits	○ Provide methodologies, indicators, and strategies for energy efficiency improvements in developing country contexts.
EPRA Renewable Energy and Energy Efficiency Portal	○ Central source of information on licensing, standards, tariffs, and incentives for renewable energy and efficiency in Kenya.
Energy (Energy Management) Regulations, 2025	○ Promote energy management in commercial, industrial, and institutional facilities to reduce energy use per unit of production. They apply to facilities consuming over 180,000 kWh annually (electrical and thermal)
Energy (Solar Photovoltaic Systems) Regulations, 2012	○ Ensure the safety and quality of solar PV systems and apply to all stakeholders, including manufacturers, installers, vendors, contractors, and system owners
Energy (Solar Water Heating) Regulations, 2025	○ Aims to ensure safety and quality of solar water heating systems in the entire value chain.
Energy Act, No 1 of 2019	○ Consolidates Kenya's energy laws, creating a comprehensive framework for renewable energy, electricity, and petroleum. It also defines requirements for licences in generation, transmission, distribution, and retail supply of energy.
Energy (Appliances' Energy Performance and Labelling) Regulations (Kenya, 2016)	○ Mandate that specific household and industrial appliances meet defined efficiency levels, utilising a 1–5 star rating system. Mandatory for refrigerators, air conditioners, motors, and lamps, these standards prohibit selling underperforming products.

Success story

Makueni County Referral Hospital

Wote, Kenya

Through a partnership between the County Government and UK-PACT, the hospital installed a solar PV system to reduce grid dependency and diesel generator use.

Project Scope

Installation of a **200 kilowatt-peak (kWp)** solar PV system designed to meet ~30-33% of daytime energy demand.

548k

KES Monthly Savings

100%

Daytime Reliability

"Beyond cost savings, the solar plant improves power reliability, ensuring critical medical services are less affected by outages."

Sustainable Water Management

Towards net zero water use within health system

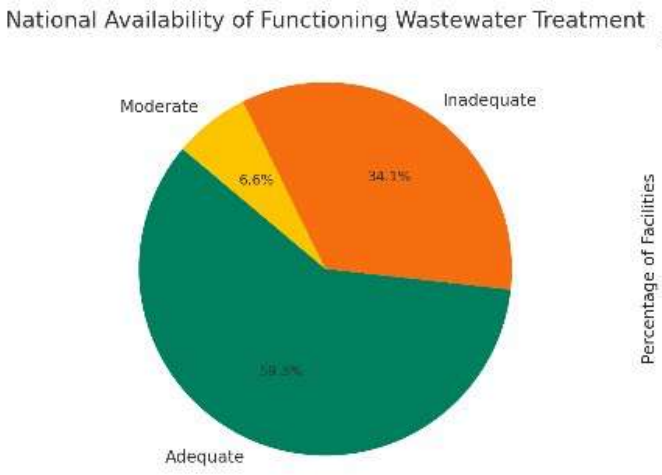
Key Intervention Area 3

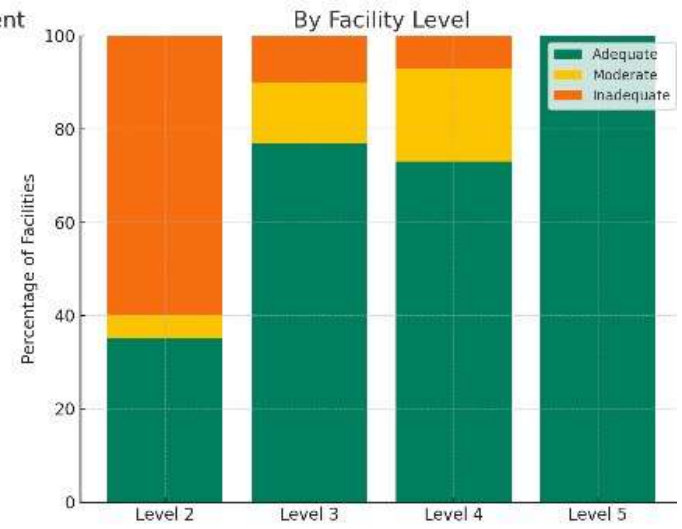
State of Water Management

Water is essential to safe, effective, and resilient healthcare delivery.
Recognizing the growing challenges of water scarcity, climate change, and inadequate wastewater management, this guidelines promote sustainable water stewardship across health facilities while protecting both public health and the environment.

According to the 2022 Kenya Status Report on Infection Prevention and Control in Healthcare Facilities, Basic Hygiene, and Hand Washing Services, only 64% of health facilities have adequate access to water. However, this figure is not uniform across all levels of care, with water availability varying by facility level:

- 53% at Level 2,
- 63% at Level 3,
- 80% at Level 4,
- and 100% at Level 5.





Overall availability of functional wastewater treatment system is at 59.3% , increasing with the level of care

- 100% at level 5 & 6,
- 35% at level 2)

Water Management: *From efficiency basics to net zero water independence*

Implement a series of conservation, recycling and treatment measures to reduce hospital water consumption and wastewater pollution.

Recommended Actions

1	**Conduct Water Audits**	Establish baseline consumption data to identify high-usage areas and leaks, enabling targeted conservation strategies.	Priority
2	**Install Water-Efficient Fixtures**	Retrofit facilities with low-flow taps, dual-flush toilets, and efficient showerheads to reduce wastage at point of use.	Efficiency
3	**Implement Rainwater Harvesting**	Capture and store rainwater for non-potable uses like landscaping, laundry, and cleaning to reduce reliance on municipal supply.	Resilience
4	**Wastewater Treatment & Reuse**	Install on-site treatment systems for recycling greywater in irrigation or cooling systems, especially in off-grid locations.	Circular
5	**Sustainable Landscaping**	Design hospital grounds with drought-resistant indigenous plants (xeriscaping) to minimise irrigation requirements.	Outdoor
6	**Water Quality Monitoring**	Regularly test and monitor the quality of water to ensure that it meets health and safety standards.	Safety
7	**Phase out the use of bottled water** facility-wide, provided that high-quality potable water is available		

Path to Net Zero Water

Policy Aspiration & End Goal

The Goal

100% of occupants' water use from captured precipitation or reused water. 100% of discharge managed on-site.

Implementation

Form net-zero water team, hold charrette, prioritise conservation first, then address supply chains and regulatory issues.

Sources

Harvest rainwater, reuse greywater, capture A/C condensate, treat wastewater on-site, and reclaimed municipal water.

Tools & Resources

Tool/Framework	Description / Use
WHO/UNICEF Joint Monitoring Programme (JMP) for WASH in Health Care Facilities	○ A global monitoring system providing comparable data and benchmarks for water, sanitation, and hygiene in healthcare facilities.
Water and sanitation for health facility improvement tool (WASH FIT)	○ A practical, step-by-step tool to assess, prioritise, and improve water and sanitation services in healthcare facilities, including risk-based management.
ISO 46001:2019 – Water Efficiency Management Systems	○ International standard guiding organisations, including hospitals, to establish water efficiency policies, objectives, and monitoring systems.
Kenya Environmental Management and Coordination (Water Quality) Regulations, 2006	○ Legal framework governing wastewater discharge standards and water pollution control for institutions, including healthcare facilities.
Kenya Healthcare Facilities WASH Guidelines and Standards	○ Integrates PC score into the star rating system for healthcare facilities
WHO Guidelines on hand hygiene in community settings	○ Are concerned with the practice of hand hygiene to protect community health outcomes, in particular, the reduction of diarrhoeal diseases and acute respiratory infections.

Case Study

Moi Teaching & Referral Hospital

Eldoret, Kenya

MTRH addressed chronic water shortages and high bills by implementing a comprehensive water management strategy essential for infection prevention and patient care.

Key Interventions

- Rainwater harvesting from roof catchments
- Underground reservoir storage system
- Installation of low-flow taps & dual-flush toilets
- Departmental metering for accountability

Reliable
Supply during rationing

Reduced
Monthly water bills

"Supplementary sources now support laundry, cleaning, and landscaping, significantly reducing dependence on municipal supply."

Sustainable Waste Management

Towards a circular healthcare

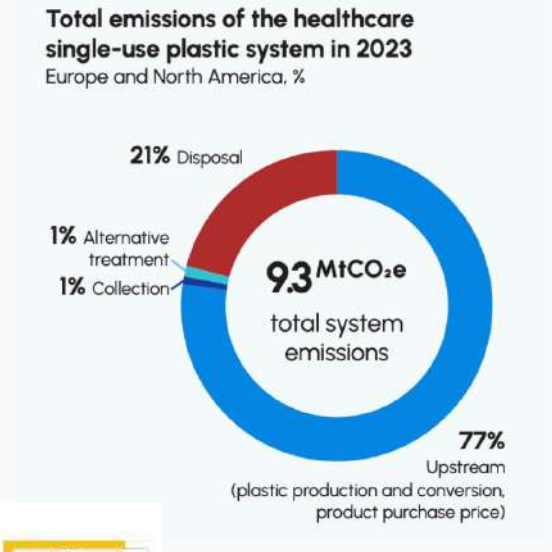
Key Intervention Area 4

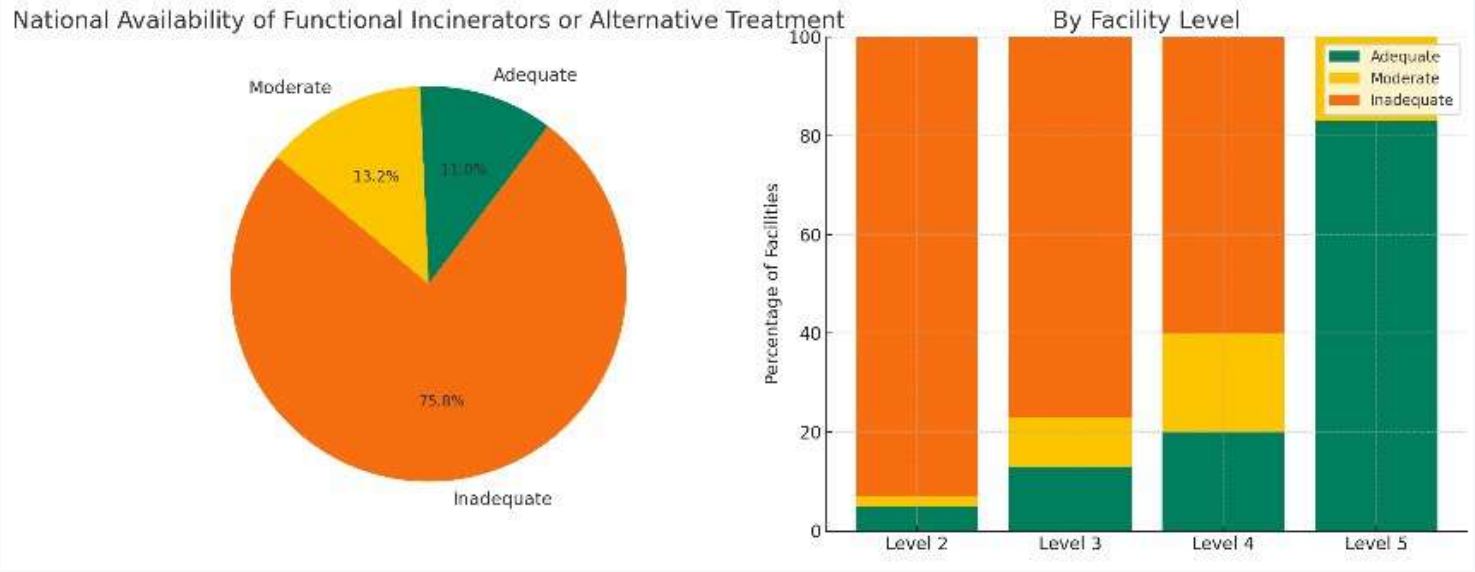
Current State of Waste Management

Healthcare waste comprises materials discarded from healthcare facilities, such as used needles, syringes, bandages, and chemicals, general waste. According to the WHO, about 15-25% of total health-care waste is infectious waste, and improper handling of healthcare waste can cause serious health problems for workers, community and environment.

Kenya generates about **24,000 tons/year** of medical waste. Availability of functional incinerator or alternative treatment is at 13.2% nationally, with 83% availability at level 5 and a 5% availability at level 2

- 1.2 million metric tons of single-use plastic waste was generated by healthcare systems in the U.S. and Canada in 2023.
- Hospitals across U.S.A. and Canada would pay up to $37 billion annually in plastic waste management costs by 2040





Waste Management

Intervention Area 4

Recommended Actions

1	**Undertake Comprehensive Waste Audits**	Gather accurate data on waste streams, quantities, and handling methods to inform strategic decisions and track progress.	Priority
2	**Implement Segregation at Source**	Establish robust systems for separating waste streams at the point of generation. Promote recycling of non-hazardous materials to reduce landfill burden.	Critical
3	**Adopt Non-Burn Technologies**	Transition from incineration to sustainable non-burn treatment technologies for unavoidable waste, minimising harmful emissions. The technologies include microwave and autoclave technologies for medical wastes, anaerobic digesters and composting systems for organic wastes.	Strategic
4	**Worker Safety and Training**	Ensure all waste handlers receive adequate training, vaccinations, and appropriate PPE. Enforce safe injection practices.	Safety

Key Objective

Protect public health by reducing the volume and toxicity of waste produced by the health sector, while implementing the most environmentally sound waste management and disposal options..

Reduction
Zero Waste
Avoidance & Segregation

Treatment
Non-Burn
Transition technology

Recycling
Partnership Model

High %
Segregation Compliance

Tools & Resources

Tool/Framework	Description/Use
National Guidelines for Safe Management of Healthcare Waste 2024	Current national guidelines providing technical standards for segregation, treatment, transportation, and disposal of healthcare waste in Kenya. Developed to align with international best practice.
Sustainable Waste Management Act, (Kenya, 2022)	This is the primary law governing all waste streams in Kenya, including healthcare waste. It mandates source segregation, extended producer responsibility (EPR), and standards for safe treatment and disposal. For pharmaceutical waste, it promotes medicine take-back programmes, non-incineration options where feasible, and strong inventory control to minimise expiries
The Pharmacy and Poisons (Pharmaceutical Waste Management) Rules, 2022	Has provisions for minimization and safe management of pharmaceutical wastes.
Sustainable Waste Management Regulations (Kenya, 2024)	Legal notices under the SWM Act that operationalize segregation rules, colour coding of waste, and licensing of medical waste transporters and disposal sites.
National Solid Waste Management Strategy	Provides a strategic roadmap for integrated solid waste management in Kenya, including safe handling of hazardous healthcare waste.

Case study

Nakuru County Referral Hospital

Microwave Waste Treatment

Nakuru, Kenya

Facing large volumes of biomedical waste, the County Government of Nakuru invested in a microwave incinerator and a waste shredder at the Nakuru Level 5 Hospital.

Intervention Strategy

The equipment can treat over 250 kg of hazardous waste daily, thoroughly disinfecting, sealing and thereafter shredding it into compostable material and sterilizing it with temperatures of above 100 degrees. It is later dumped safely at the rehabilitated Gioto dumpsite.
The County also proposed to install another MWTM with a capacity of 50 kg/hr at Langalanga Sub-County Hospital.

Recycling
Partnership Model

High %
Segregation Compliance

"Interventions reduced occupational hazards, improved compliance, and fostered a culture of accountability in waste management."

Sustainable Procurement and Supply Chain Management

Buy smarter, Build a greener supply chain

Key Intervention Area 5

State of healthcare procurement

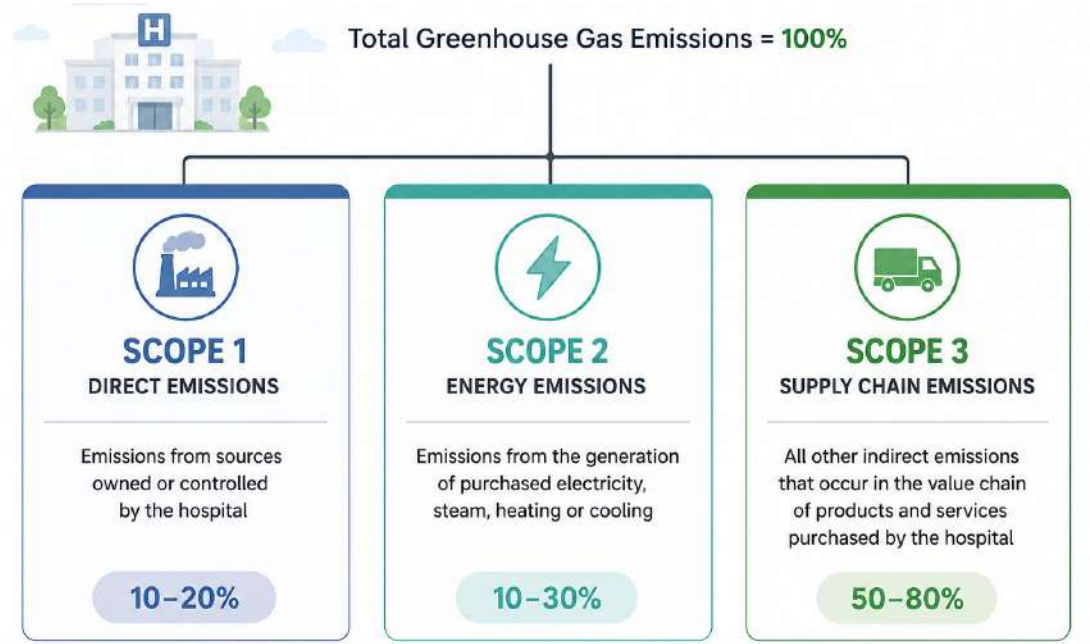
Sustainable procurement is the process of purchasing goods, services, and works in a way that achieves value for money and generates benefits not only to the organisation, but also to society and the economy, while minimising damage to the environment.

It considers three dimensions simultaneously:

- Financial value (Total Cost of Ownership)
- Environmental impact (carbon footprint, toxicity, waste)
- Social value (local employment, fair labour practices, community health).

Globally, the healthcare supply chain contributes more than 70% in greenhouse gas emissions.

The majority of a health facility's environmental footprint is invisible. It is embedded in every syringe, medicine, roll of cotton wool, and every piece of furniture that the facility purchases.



Disinfectants, cleaning products, sterilants, anaesthetic gases, mercury, hazardous drugs and pesticides used in health-care settings may be harmful to health workers.

Cleaning agents and disinfectants have been associated with a 67% increased risk of new-onset asthma in nurses (1).

Bleach and glutaraldehydes have been associated with double the risk of asthma in nurses (1).

The environmental impact of sevoflurane for seven hours of surgery is equivalent to driving **1,566 km**, while desflurane could be equivalent to **3,924 km or up to 15,698 km,** depending on the fresh gas flows.

The guidelines will help healthcare organisations embed environmental, social, and governance (ESG) and lifecycle thinking into purchasing.

Procurement & Supply Chain Management

Buy Smarter. Build Greener.

Recommended Actions:

Policy & Planning Actions

- **Integrate ESG Criteria:** Develop formal Sustainable Procurement Policy (SPP) which integrates environmental, social, and governance clauses in all tenders
- Prioritise **Reduction** before procurement
- Green Procurement & Supply chain management Strategies for environmentally preferable purchasing and total asset lifecycle management
- **Life cycle costing:** Develop a medical technology asset management plan using Total Cost of Ownership (TCO) to cover operation, maintenance, and disposal, and strengthen health technology management by decommissioning equipment to capture e-waste
- **Prioritise local sourcing** to boost community development and reduce transport-related emissions.
- **Supplier Transparency:** Require suppliers to disclose chemical ingredients, safety data, and sustainability practices.
- **Sustainable product lists:** Update essential product lists to include environmentally friendly pharmaceuticals and non-pharmaceuticals..
- Mandate **Responsible Reuse and Recycling protocols** for end-of-life assets

Chemical Substitution

- **Eradication of asbestos:** Ensure safe removal and disposal of asbestos from all healthcare settings and at the community level in compliance with NEMA guidelines.
- **Eliminate mercury:** Participate in WHO-HCWH Global Mercury-Free initiative; replace mercury thermometers and BP devices with digital/aneroid alternatives.
- **Substitute other hazardous chemicals:** Phase out glutaraldehyde, PVC, DEHP; implement safer alternatives like hydrogen peroxide disinfectants and silicone devices.
- **Worker protection and surveillance:** Provide regular training, medical surveillance, appropriate PPE, and ensure adequate ventilation/closed systems.

Global Warming Potential (GWP) Medical and Facility Gases

- **Phase down high global warming potential (GWP) anaesthetic agents** such as desflurane and nitrous oxide, and adopt lower-impact alternatives like sevoflurane, regional, or spinal anaesthesia where clinically appropriate.
- **Promote low-flow anaesthesia techniques** by incorporating them into SOPs, continuous professional development, and mentorship programmes for anaesthesia providers.
- **Improve scavenging and ventilation systems** in operating theatres to minimise leakage and accumulation of anaesthetic gases.
- **Build capacity of anesthetists and theatre teams** on sustainable anesthesia practices through targeted training, and integration into pre-service curricula.
- **Air conditioning & refrigeration gases (F-gases):** Transition to low-GWP refrigerants, ensure proper maintenance to prevent leaks, recover/recycle gases during servicing and decommissioning, and upgrade to energy-efficient cooling systems.
- **Monitoring & reporting:** Establish systems to track gas use and wastage, linking data to hospital environmental reporting mechanisms.

Key Outcome: **Every procurement decision becomes a sustainability decision** - shifting focus from initial price tag to long-term environmental, social, and financial value.

Chemicals of Concern in Health Sector & their alternatives

Chemicals of concern refers to chemicals that, through credible evidence, have or pose risks of adverse health effects to people or the environment.
The most common hazardous chemicals in the health sector include furnishings, construction materials, cleaning and disinfecting agents, sterilant, mercury, toxic drugs, pesticides, latex, and laboratory chemicals and reagents.

	Category	Alternatives
1.	Triclosan and Ticlocarban (Antimicrobial agents in soaps and disinfectants)	• Use plain, biodegradable soap and water instead of harsh chemical-based or antibacterial soaps. • When hands are not visibly soiled, use alcohol-based hand rubs (with ≥ 60% alcohol e.g., ethanol/isopropanol)
2.	Formaldehyde (used in disinfectants, pathology labs, and embalming).	• **For disinfection:** Accelerated hydrogen peroxide, Hydrogen peroxide vapour • **For preservation of specimens:** Phenol-based solutions - Alcohol-based fixatives.
3.	Polyvinyl chloride (PVC) - used in IV bags, tubing, flooring.	• Medical devices made from materials like: Silicone, Polyurethane, Polyethylene, Ethylene-vinyl acetate (EVA)
4.	Sodium Hypochlorite (Bleach)	• **For cleaning:** High-filtration vacuum cleaners, Automatic scrubbing machines that use only water, Microfiber technology • **For surface disinfection:** Hydrogen peroxide-based disinfectants, Citric acid-based disinfectants, Electrochemically activated water (ECAW), and Ultraviolet light, where appropriate
5.	Mercury (used in thermometers, sphygmomanometers, lab reagents)	• Digital or aneroid thermometers • Sphygmomanometers (blood pressure cuffs). • Galinstan thermometers (a non-toxic gallium-indium-tin alloy) • Use manual control switches instead of mercury switches in X-ray machines
6.	Phthalate plasticizers in coatings for drugs (used in drug coatings, IV bags, tubing)	• Citrate esters (e.g., ATBC) • Cyclohexanoates (e.g., DINCH) • Bio-based plasticizers. • Using glass or polyolefin containers for drug delivery when possible.

Some Dangerous Chemicals in the Lab

	Chemical	Alternatives
1.	Acetonitrile	• **For chromatography,** acetone or methanol can be substituted as mobile phase solvents, depending on the application. • **For extraction/purification,** ethyl acetate or dichloromethane (DCM) can be used though DCM has its own hazards (carcinogen).
2.	Chloroform	• For DNA/RNA extraction: Commercial kits that use non-halogenated, less toxic buffers
3.	Dimethyl Sulfoxide	• Glycerol (cryoprotectant), ethanol (solvent in some cases)
4.	Formaldehyde	• **For tissue fixation:** Ethanol-based fixatives; Bouin's solution (for specific applications). • **For disinfection:** Hydrogen peroxide-based disinfectants; Quaternary ammonium compounds.
5.	2-Mercaptoethanol	• Dithiothreitol (DTT) is more stable, less volatile, and has a much less potent odor. • Tris(2-carboxyethyl) phosphine (TCEP) is even more stable, odorless, and effective at a wider pH range
6.	Methanol	• Ethanol or isopropanol are generally less toxic. For chromatography, acetonitrile or acetone may be alternatives, depending on the analysis.
7.	Sodium Azide	• Thimerosal, ProClin, or hydrogen peroxide (depending on application)
8.	Sodium Hydroxide	• Potassium carbonate or tris buffer for pH adjustment • Enzymatic cleaners instead of caustic soda
9.	Tetrahydrofuran (THF)	• 2-Methyltetrahydrofuran (bio-based, safer solvent) or ethyl acetate

Procurement and Supply Chain Management

Intervention Area 5

Tools & Resources

Tool / Framework	Description / Use
Sustainable Health Procurement Guidance Note (UNDP & Health Care Without Harm, 2020)	○ Provides practical guidance for integrating environmental, social, and economic sustainability into health procurement. Outlines criteria for sustainable products, supplier transparency, and lifecycle costing, and offers examples from global health systems to guide hospitals and ministries.
ISO 20400: Sustainable Procurement Standard	○ An international standard providing principles and guidance for integrating sustainability within procurement processes.
Public Procurement & Asset Disposal Act (Kenya, 2022)	○ Provides procedures for efficient public procurement and for assets disposal by public entities.
Guidelines for Donation of Health Products and Technologies (Kenya, 2026)	○ Provides a structured framework for the receipt, evaluation, and approval of donated Health Products and Technologies.
WHO Guidelines on Safe Surgery and Anaesthesia	○ Provides global standards for safe, effective, and sustainable anaesthesia practices.
Association of Anaesthetists Environmental Sustainability Guidance (2019)	○ Practical framework for anaesthetists to reduce environmental impact in clinical practice.
Global Green and Healthy Hospitals (GGHH) - Green OR Toolkit	○ Provides case studies, strategies, and tools to reduce emissions from operating rooms.
ISO 14064 GHG Accounting Standard	○ Methodology for quantifying and reporting GHG emissions, including anaesthetic gases.
Kenya Anaesthesia Guidelines (2016)	○ Provides standards for safe anaesthesia practice in Kenya; a foundation for integrating sustainability measures.
WHO Human Health Risk Assessment Toolkit: Chemical Hazards	○ Helps facilities track chemical use, identify hazardous substances, and prioritise safer substitutions.
Green Procurement Guidelines (UNDP)	○ Guides hospitals in sourcing safer, sustainable products.
OECD SAAToolbox	○ Provides methodologies for comparing hazards, performance, and costs of alternatives.

Case Studies

George Regional Hospital
Western Cape, South Africa

Integrated environmental stewardship into strategic priorities, updating tenders to favour recyclable packaging and identifying "green suppliers" for consumables.

Replaced polystyrene food containers with **sugarcane-based alternatives** and virgin plastic bags with reusable cloth options.

Barwon Health
Australia

Launched "No Unhelpful Tests" initiative to optimise clinical operations and reduce environmental footprint.

$885K Saved | -906kg CO2e | 726 Hrs Saved

Aga Khan University Hospital
Nairobi

Prioritised reducing Scope 1 emissions by addressing anesthetic gas usage through phasing out desflurane and NO_2. Clinicians were also trained in low-flow anesthesia techniques to minimise unnecessary gas release without compromising patient safety.

Sebokong Hospital
Gauteng, South Africa

Tackled hazardous cleaning chemicals causing staff injuries by phasing out high-risk agents and implementing safer alternatives and protocols.

"Safer chemical management led to fewer staff injuries, reduced procurement of dangerous agents, and better overall cleanliness."

Healthy Food Services

Nourish People, Respect the Planet

Key Intervention Area 6

Food services

Nourish People. Respect the Planet.

Food in a health facility is simultaneously a clinical intervention and an operational challenge.

- For patients: the quality, nutrition, and palatability of hospital food directly affect recovery speed, treatment adherence, and length of stay.
- For facilities: food services represent one of the largest operational cost centres after staffing and medicine procurement.
- For the environment: the food service sector is a significant contributor to greenhouse gas emissions, water consumption, and waste generation.

Strategies for sustainable food services in healthcare include:

Source & Serve Responsibly

- Audit origins and source food from farms within a **200-km radius**
- Partner with Group Purchasing Organisations (GPOs) for local purchasing options
- Prioritise products with independent **third-party eco-labels**
- Reduce carbon emissions by offering smaller meat portions & increasing vegetarian options.

Reduce Waste

- Systematically **track food waste** generation
- Reduce trim waste, spoilage, and contamination
- Adjust portion sizes while maintaining nutritional standards
- Set specific, measurable reduction goals

Close the Loop

- Transition to **compostable service ware** & take-away containers to minimise plastic waste
- Implement a usable food donation programme
- Divert organic waste from landfills via **composting** or **anaerobic digestion** to cut methane

Tools & Resources

Tool / Resource	Description
Health Care Without Harm – Healthcare Waste Trackers Toolkit	○ The toolkit supports baseline waste audits, routine waste tracking, and reporting dashboards that allow hospitals to monitor progress and identify opportunities for waste reduction and improved waste segregation.
Waste & Resources Action Programme – Preventing Food Waste in the Healthcare Sector Toolkit	○ A guidance toolkit designed for hospital catering services that provides practical strategies for reducing food waste. It includes food waste measurement methods, menu planning guidance, procurement improvements, and operational changes that reduce waste in kitchens, wards, and cafeterias.
Practice Greenhealth - Less Food to Landfill Toolkit	○ A comprehensive implementation toolkit used by healthcare facilities to reduce food waste and improve sustainable food service operations. It provides waste assessment tools, staff training resources, communication materials, and case studies demonstrating how hospitals can reduce food waste through improved kitchen operations and waste diversion practices.

Best Practice

Hunter Brain Injury Svc

Australia

Implemented patient-led food waste management programme contributing to recovery and sustainability.

Food Recovery | Waste Management | Patient-Led

Mederi Hospital Network

Colombia

Installed composting system to divert organic waste from landfills and reduce disposal costs.

-18% Landfill | $2K/yr Saved | 3+ Tons Diverted

Green Building and Infrastructure Management

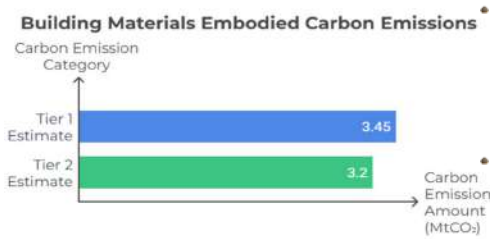
Design for climate, Build for Resilience

Key Intervention Area 7

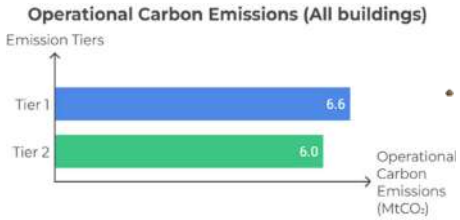
State of Building and Construction

- Building construction activities account for 40% of raw stone, gravel, and steel generated and consume 25% of the world's virgin lumber. Building construction and demolition generates approximately 50% of municipal solid waste.
- Buildings further deplete the stratospheric ozone layer by using refrigerants and products manufactured with ozone-depleting compounds, including insulation materials.
- Buildings use over 75% of the world production of polyvinyl chloride (PVC). Production of chlorine, a principal ingredient of PVC, is one of the world's most energy-intensive industrial processes, consuming approximately 1% of the world's total electricity output.
- The built environment sector is the largest emitter of CO_2 and account for at least 37% of global emissions with the production of concrete, steel and aluminium taking 6% while glass and bricks takes 2-4% of the total emissions.
- Overall, the health sector comprises more than one-third of the worldwide institutional building construction market.

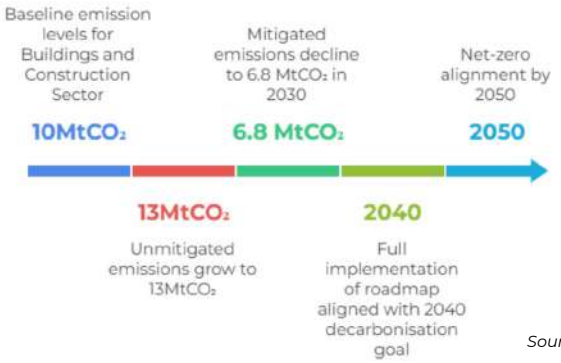
In Kenya,
The building and construction sector accounts for a total of 10.05 MtCO2/year, which is responsible for appr. 11% of national emissions.



- *Tier 1 estimates total embodied emissions at 3.45$MtCO_2$ representing the baseline impact from material production and construction processes.*
- *In Tier 2, emissions are reduced to 3.2$MtCO_2$ through use of alternative building materials like earth.*



- *Tier 1 estimates baseline total operational emissions across all buildings at 6.6$MtCO_2$.*
- *In Tier 2, emissions are reduced to 6.0$MtCO_2$ through integration of energy efficiency measures (e.g. MEPS, light8ing, appliances).*



- Assuming no additional interventions, building-related emissions are projected to grow 2-3% annually from 10.05$MtCO_2$ in 2023 to 12-13$MtCO_2$ by 2030
- The sector would need to cut emissions from 13$MtCO_2$ to 8.8$MtCO_2$ to achieve Kenya's NDC target of 32% national reduction in emissions from the business-as-usual scenario (BAU) by 2030.

Source: Kenya's National Buildings and Construction Decarbonization Roadmap, 2026

Green Building Design and Facility Management

Intervention Area 7

Design Principles

Design strategies for climate resilience, biodiversity, and health co-benefits.

Optimising indoor environmental quality and outdoor facility operations.

1. **Passive Building Systems** — Prioritise narrow floor plates for natural daylighting and ventilation to reduce reliance on mechanical cooling and lighting systems.
2. **Eliminate Toxic Materials** — Eliminate lead/cadmium paints, lead-based batteries, asbestos, PVC, and halogenated flame retardants, and replace them with safer, non-toxic alternatives such as lithium batteries.
3. **Renewable Energy Integration** — Incorporate onsite renewable energy (solar, wind) and high-reflectance roofing or "green roofs" to mitigate heat island effects.
4. **Energy Monitoring** — Tracking of energy use in healthcare facilities to identify inefficiencies, reduce costs, and lower carbon emissions
5. **Sustainable Site Design** — Minimise construction footprint, protect natural habitats, use permeable paving, and integrate facility with local landscape.
6. **Occupant Well-being** — Enhance indoor environmental quality through advanced air quality control, natural ventilation, and acoustical settings.
7. **Green Building Certification** — Design to the appropriate green building rating system as the minimum starting point.

Nature-based Site Management

- **Indoor Operations:** Maximise daylight use while controlling glare; install light shelves and occupancy sensors.
- **Heat Island Reduction:** Use high-SRI paving materials; implement covered parking (≥50%); maintain reflective surfaces.
- **Vegetated Roofs:** Install and maintain vegetated roofs on at least 50% of available roof area where structurally feasible.
- **Outdoor Comfort:** Provide shading via trees or architectural devices to eliminate direct sunlight exposure.

Reconnect Facilities with Nature.

Co-Benefits ✓ Air Filtration ✓ UHI Mitigation ✓ Staff Wellbeing ✓ Biodiversity

Green Building Design and Facility Management

Tools & Resources

Tool/Framework	Description / Use
Kenya's National Building and Construction Decarbonization Roadmap (2026)	o A national strategy towards zero emissions buildings.
National Building Code, 2024	o The new code replaces the outdated 1968 bylaws to enhance safety, sustainability, and efficiency in the construction industry.
Niko Green Building Manual, 2026	o This technical manual provides guidance and performance criteria for the design, construction, and certification of green buildings.
Proposed Green and Resilient Buildings Regulations, 2023	o To regulate green building practice in Kenya.
GreenMark Standards for Green Buildings	o GreenMark is a tool for rating and certification of green buildings in Kenya, managed by Green Africa Foundation.
IFC EDGE	o A green building certification system that focuses on cost-effective strategies to reduce energy use, water consumption, and embodied energy in materials.
WHO guidance for climate resilient and environmentally sustainable health care facilities	o Provides standards and recommendations for designing and operating healthcare facilities that minimise environmental impact while protecting health.
LEED for Healthcare	o A certification tool that evaluates sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality in healthcare facilities.
Green Star – Healthcare	o A comprehensive green building rating tool that assesses performance across categories such as energy, water, emissions, materials, and indoor environment quality.

Case studies

Kaiser Permanente San Diego Medical Centre

San Diego, CA, USA | 617-bed Facility | Opened 2017

World's First Double LEED Platinum Hospital

Smart Controls

Energy Efficiency
Power for 3,500 Homes -30%
Annual equivalent savings

Water Reclamation

Water Savings
1.5M Litres/Month -40%
Vs. traditional landscaping

Solar Integration

On-Site Generation
Cogeneration System 100%
Heat, cooling & electricity

Materials & IAQ
Low-Emitting Materials A+
Furniture, flooring, insulation

AAR Hospital

Kenya

AAR Hospital building recognised for sustainable building design and operations.

Sustainable Transportation

Towards a low-carbon mobility and logistics

Key Intervention Area 8

State of Transport in Healthcare

Patient Mobility ↔ **Medical Logistics** ↔ **Employee Mobility**

Road transport contributes 18% of the world's total CO_2 emissions from fuel combustion. And by 2030, carbon dioxide emissions from transportation are projected to rise by 60%

The health sector, with its fleets of ambulances, hospital vehicles, delivery vehicles, and staff and patient travel, is a transportation-intensive industry. Air pollution impacts from health care are concentrated near large-scale hospital facilities.

Exposure to transport-related carbon monoxide, sulphur dioxide, and nitrogen dioxide can cause respiratory illness and alter the lung's defence systems.

The UK National Health Service estimates that the CO_2 emissions related to the transportation of staff and patients to healthcare settings equal approximately 18% of its total carbon emissions.

In Kenya,

- → Less than 50% of the urban population have access to public transport within a 10-minute walk, due to the poor public transport coverage.
- → Rural patients travel **45 km on average** to reach hospitals, primarily via petrol/diesel-powered buses and motorcycles. Nationally, this contributes **8,000 tons CO_2e/year**
- → An NCD patient from Mandera **(800 km away) generates 180 kg CO_2e** via bus travel for a single consultation - equivalent to 20% of Kenya's per capita annual emissions
- → **Logistics** for vaccine cold chains are critical for Kenya's immunization programmes, which account for **15% of healthcare transport emissions**.
- → Importing a single MRI machine from Germany emits **1.8 tons CO_2e** in transport, with lifetime energy use adding 25 tons/year.
- → Relying on local innovation and manufacturing can cut supply chain emissions by 50%

Mode of transport to hospital	Percentage
• Walking	29%
• Motorcycle	36.6%
• Personal cars	15.8%
• Public vehicles (e.g., bus, matatu)	18.6%

Transportation and logistics

Move People & Products. Reduce Emissions.

Fleet Strategy

Operational Assets

Clean Vehicle Procurement

Own, lease, or contract low-emitting vehicles (biodiesel, LPG, electric)

Mileage Mandate

Ensure 50%+ of total annual fleet mileage comes from clean vehicles

Infrastructure Support

Provide fuelling/charging infrastructure for alternative-fuel fleet

Employee & Commuter

Behaviour Change

Transit Incentives

Rewards for using public transit, cycling, or walking

Shuttle Services

Connection to major transit hubs & bus stations

Preferred Parking

Priority spaces for carpools & low-emission vehicles

Fleet Optimisation

Evaluate needs to reduce single-occupancy vehicle use

Transport planning

Operational Assets

Active Transport

Connect green experiences along transit paths to encourage walking and cycling.

Decentralised care delivery

Provide services in easily accessible locations (community-based care, home care) to reduce long-distance patient travel.

Efficient Logistics

Prioritise local suppliers, manage waste near source, and optimise delivery routes to minimise transport emissions.

Tools & Resources

Tool/Framework	Description / Use
National Electric. Mobility Policy (Kenya, 2026)	○ Promotes development and adoption of electric mobility in Kenya
National Transport and Safety Authority Act (Kenya, 2012)	○ Establishes NTSA to regulate matters relating to road transport and safety
KS ISO / Standards for Electric & Hybrid Vehicles	○ Kenyan standards (KS ISO 17409:2015; KS ISO 23274 parts; others) that define safety, performance, and emissions/fuel consumption measurement procedures for hybrid-electric, battery-electric, and externally chargeable vehicles in Kenya.
Roadmap for Harmonisation of Vehicle Emission Standards in East Africa	○ A regional framework via East African Community to harmonise vehicle emission standards (new vehicles, used imports, and in-use vehicles) to shared benchmarks, including alignment with low-sulfur fuels and Euro-standards.
smartTrans Kenya (Smart & Safe Kenya Transport Data & Analytics Platform)	○ A World Bank/Kenyan government initiative developing tools for transport data, analytics, and evidence-based interventions to improve road safety and potentially also reduce transport emissions.

Case Studies

Zipline Partnership Drone Medical Delivery

Rwanda

Rwanda pioneered drone delivery for blood and essential medical supplies to remote hospitals, bypassing poor road infrastructure and reducing fossil fuel reliance.

Deliveries reduced from several hours by road to **within 30 minutes** by air, eliminating landing infrastructure needs.

SERGAS

Spain

Transitioned patient transport fleet to electric ambulances, drastically cutting emissions and fuel costs.

-80% CO2 | -97% Fuel | €€22/100km Saved

Digital Health

Towards a smart healthcare

Key Intervention Area 9

Digital health

Intervention 9

Digital health and telemedicine offer a powerful opportunity to improve healthcare access, efficiency, and sustainability.

Through remote care, electronic information systems, and digital innovation, health facilities can reduce environmental impacts, strengthen service delivery, and improve health outcomes for the populations they serve.

Use digital tools and email consultations to reduce face-to-face visits, minimising travel-related environmental impact.

Strategic Pillars for Advancing Digital Health in Kenya

Digital Infrastructure

Strengthen facilities with reliable power and high-speed internet. Deploy interoperable telemedicine platforms integrated with national systems (HL7/FHIR) to ensure seamless data exchange.

Capacity Building and awareness creation

Incorporate telemedicine training into pre-service education and CPD programmes. Empower workforce with digital literacy skills to leverage remote care tools and data for quality improvement.

Equity & Access

Reduce travel emissions and improve access by integrating teleconsultation costs into SHIF. Equip Community Health Volunteers (CHVs) with digital tools for last-mile remote care.

Policy Framework

Align operations with the Kenya National eHealth Policy (2016–2030) and mHealth Guidelines. Adhere to ISO/TS 13131 quality standards and leverage the WHO Global Digital Health Strategy.

Key Strategic Enablers

- eHealth Policy 2030
- mHealth Guidelines
- Digital Health Act
- Broadband Strategy
- Data Protection

Tools and Resources

Tool / Framework	Description / Use
WHO Global Strategy on Digital Health (2020–2025)	Provides a framework for integrating digital health technologies, including telemedicine, to improve access, equity, and sustainability.
Kenya National eHealth Policy (2016–2030)	Guides the adoption of digital health technologies, ensuring interoperability, data security, and equitable access across counties.
Digital Health Act 15 of 2023	The primary legislation establishing the Digital Health Agency and governing digital health systems in Kenya.
The Digital Health (Data Exchange Component) Regulations 2025	Regulations governing the exchange of health data between systems and entities in Kenya.
DRAFT Digital Health (Use of e-Health Applications and Technologies) Regulations, 2024	Regulations governing the use of electronic health applications and technologies in healthcare delivery.
Kenya mHealth Standards and Guidelines (2017)	Offers national standards for implementing mobile and telemedicine services within the Kenyan health system.
ISO/TS 13131:2021 – Telehealth Services: Quality Planning Guidelines	Provides international standards for quality management, safety, and performance in telehealth and telemedicine.
Digital Health Atlas (WHO)	A global repository for documenting and monitoring digital health implementations, including telemedicine programmes.
Health Level Seven (HL7) and FHIR Standards	Define global data interoperability standards that allow secure exchange of health information across telemedicine systems.
ICT Authority of Kenya – National Broadband Strategy (2023–2027)	Supports the expansion of broadband infrastructure necessary for reliable, high-speed connectivity in health facilities.
Digital Health Agency (DHA)	A government body dedicated to transforming healthcare delivery through the integration of cutting-edge digital technologies

Innovation

Telemedicine Centre at KUTRRH

Kenya

Since 2021, KUTRRH has pioneered telemedicine in Kenya through its Telemedicine Centre, which connects specialists with patients in rural counties such as Turkana, Kisii, and Garissa. Using high-speed internet, digital diagnostics, and video consultation platforms, the hospital offers remote radiology, oncology, and specialist follow-ups, significantly reducing referral burdens.

Pharm Access M-Tiba

M-TIBA, a mobile health wallet that allows patients to save, send, and spend money specifically for healthcare. This approach not only improves healthcare access and equity but also contributes indirectly to sustainability by reducing unnecessary travel for payments and improving financial predictability for health facility

Al-Ramad Hospital

Egypt

Implemented comprehensive energy and water efficiency measures alongside a digital transformation initiative.

-38% Energy | -7% Water | -30% Paper

Implementation Roadmap

Towards climate-resilience and decarbonization of healthcare

From recommendations to actions

Implementation Roadmap – Phased Approach

The Guidelines emphasize the importance of implementation, monitoring, and evaluation in achieving sustainable healthcare. By providing clear performance indicators, reporting mechanisms, and continuous improvement processes, the guidelines help health institutions track progress, ensure accountability, and achieve meaningful environmental and health outcomes.

The Implementation Plan is anchored on a phased, multi-level approach that integrates sustainability into policies, operations, and service delivery. It focuses on evidence-based governance, capacity building, technology adoption, financing, and continuous improvement.

Phase 1

Foundation & Pilots

Short Term (1-2 Years)

- **Establish Governance:** Form national **Green Health Platform** and facility-level **green teams**, and **green community health promoters (**CHPs).
- **Baseline Audits:** Conduct comprehensive energy, water, and waste assessments, and establish sector-wide performance benchmarks..
- **Pilot Interventions:** Launch quick-win projects in select health facilities & other health institutions.
- **Capacity Building:** Integrate sustainability into pre-service and in-service training of health workforce. Build capacity of CHPs to green households.

Phase 2

Scaling & Retrofit

Medium Term (3-5 Years)

- **Scale-up:** Expand successful pilot projects and models to all counties.
- **Facility Retrofits:** Install solar PV, rainwater harvesting, and non-burn waste technologies.
- **Mainstreaming:** Integrate green budgets into County Integrated Development Plans (CIDPs).
- **Data Systems:** Strengthen monitoring and reporting frameworks, integrating climate indicators into existing frameworks including e-Community Health Information Management System

Phase 3

Institutionalisation

Long Term (>5 Years)

- **Decarbonization Roadmaps / Net-zero Targets:** Advance sector towards low-carbon, climate-resilient operations by developing County, and facility-level/institutional healthcare decarbonization roadmaps
- **Certification:** Develop a Green health Certification Scheme for Kenya to make the identification of sustainable products and technologies easier for healthcare product purchasers, as well as certification of green health facilities and green health professionals.
- **Regional Leadership:** Position Kenya as a hub for sustainable healthcare innovation.
- **Full Integration:** Sustainability embedded in all governance and funding.

Roles and Responsibilities

Delivering green healthcare requires coordinated action across government, regulators, facilities, the workforce, and communities. Each actor carries a defined mandate.

Ministry of Health

Provide leadership and policy direction; develop standards and accreditation frameworks; coordinate national implementation; and consolidate progress reports.

Regulators (e.g. KMPDC, PPRB, KMLTTB, NEMA, EPRA, KEBS ...)

Enforce environmental, energy, procurement and product standards; conduct compliance inspections and audits.

Treasury & Development Partners

Mobilize financing from public budgets, climate finance, and donor resources.

County Governments

Integrate sustainability into CIDPs; allocate budgets for green health initiatives; supervise facility implementation & reporting.

Healthcare Facilities

Establish green task forces; prepare & implement sustainability action plans; run quarterly energy, water and waste audits; report to counties.

Healthcare Workforce

Adopt sustainable practices in daily service delivery, participate in training, and act as champions for behavioral change.

Private Sector & NGOs

Provide green technologies & services (renewable energy, waste management, construction); support financing and training through PPPs.

Research & Training Institutions

Integrate sustainability into curricula; conduct applied research and innovation; share lessons through knowledge hubs.

Communities & Civil Society

Drive awareness creation, co-implementation, and citizen accountability; support local sustainability initiatives.

National Government Priorities

This implementation plan outlines a roadmap for healthcare institutions, and other stakeholders to adopt sustainable practices that reduce the environmental footprint of Kenya's healthcare sector while improving healthcare quality.
It defines roles and responsibilities and sets phased actions to ensure sustainability is fully integrated into healthcare delivery.

SHORT-TERM

1–2 yrs

- Operationalize guidelines through circulars, standards and technical tools
- Provide orientation and training to counties on guideline implementation
- Establish national monitoring and reporting standards
- Mobilize resources and partnerships
- Launch national awareness campaigns

MEDIUM-TERM

3–5 yrs

- Allocate budget lines for sustainability in healthcare
- Integrate sustainable healthcare into universal healthcare (UHC) and nationally determined contributions (NDCs)
- Support scaling of renewable energy, digital health, and waste management systems
- Strengthen national monitoring systems

LONG-TERM

5+ yrs

- Institutionalize national green-healthcare frameworks
- Pursue international accreditation and recognition (ISO standards, WHO green health facility benchmarks)
- Drive long-term financing models for sustainable healthcare
- Serve as a regional hub for knowledge-sharing

County Government Priorities

SHORT-TERM

1–2 yrs

- Conduct county-level assessments of healthcare emissions.
- Support facilities with baseline audits of energy, water, and waste management
- Customize national policies into county-specific action plans (e.g. County Healthcare Decarbonization Roadmaps)
- Provide initial training and capacity building for county health staff.
- Implement quick-win interventions (LEDs, water-saving fixtures, waste segregation).

MEDIUM-TERM

3–5 yrs

- Retrofit and upgrade facilities (solar, rainwater harvesting, modern waste areas).
- Institutionalize sustainability into county health management practices.
- Provide regular staff training and capacity-building programs.
- Strengthen partnerships with the private sector and NGOs.

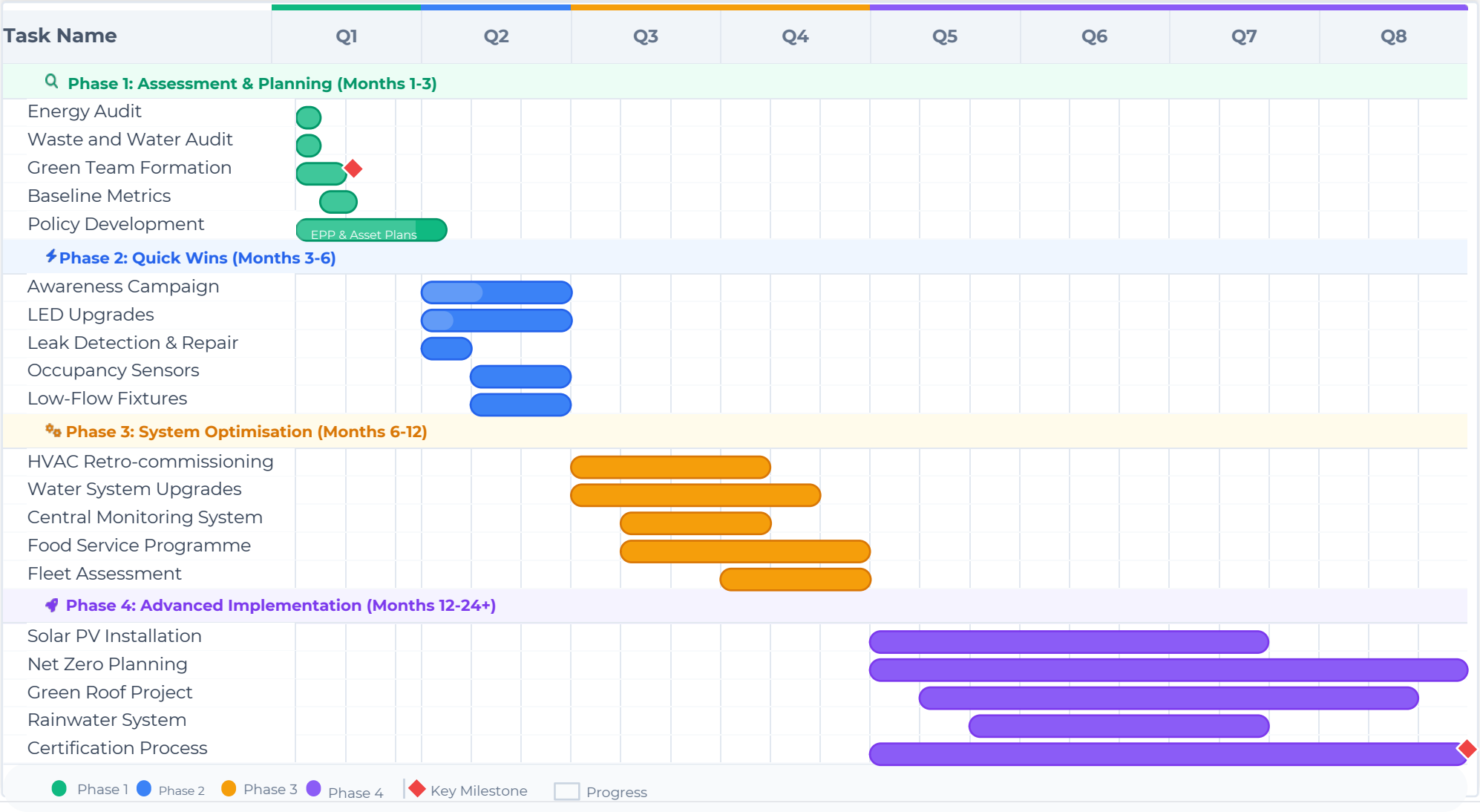
LONG-TERM

5+ yrs

- Establish centers of excellence for sustainable healthcare within counties.
- Maintain robust county-level reporting linked to national systems.
- Provide mentorship and peer-learning platforms for facilities.
- Ensure budget allocation for sustainability at county level.

Facility-level Actions

24-Month Implementation Schedule



Coordination and Advocacy

Partnership & Governance

Coordination Structure

Kenya Green Health Platform (KGHP)

National Level (MoH Patronage)

Leads policy alignment, resource mobilisation, and hosts the KGHP Secretariat.

County Linkage

County Focal Persons integrate sustainability into CIDPs and coordinate local forums.

Facility "Green Teams" & community champions

Sustainability Committees execute action plans and conduct regular audits. They also empower CHPs to green households.

National MoH /KGHP

↓

County Health Departments

↓

Facility Green Teams & Community champions

Advocacy Pillars

Driving Systemic Change

Systemic Enablement

Policy & Finance

Mainstreaming sustainability into health budgets, insurance (SHIF), and strategic plans.

Workforce Capacity

Professional Practice

Integrating green principles into clinical guidelines, CPD, and medical curricula.

Culture Shift

Community Behaviour Change

Engaging patients and staff on waste segregation, water use, and energy saving.

Market Transformation

Innovation & Market Engagement

Building local supply chains for green technologies and sustainable products.

Recognition Programme

National Green Healthcare Awards

Excellence

Facility Awards

Green Healthcare Facility of the Year for holistic environmental performance.

Best Practice

Clinical Practice

Climate-Smart Clinical Practice Award for low-emission care protocols.

Leadership

Leadership & Innovation

Recognising individual champions, emerging innovators, and circular economy leaders.

Metrics

Key Evaluation Criteria

Impact (30%), Innovation (20%), Financial Efficiency (15%), Collaboration (15%).

Barriers and Solutions

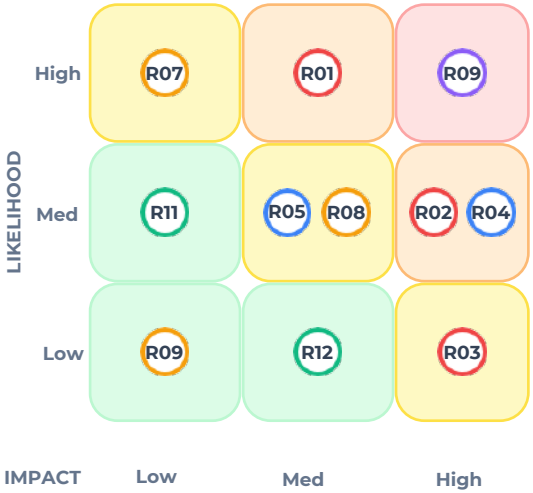
Overcoming common implementation challenges with practical strategies

Common Barriers	Practical Solutions
Financial Constraints **High upfront costs:** Budget limitations deter investment in new technologies.	**Phased Funding** Use phased implementation, grants/rebates, green bonds, and Energy Performance Contracts (EPCs).
Cultural constraints **Change fatigue:** Lack of buy-in from operational staff and stakeholders.	**Engagement Programme** Launch "Green Champions" programme, provide training, offer incentives, and involve staff early.
Technical Complexity **Legacy systems:** Incompatibility with existing infrastructure and controls.	**Modular Integration** Conduct pilot testing, use middleware solutions, leverage vendor partnerships, and modular approach.
Knowledge Gaps **Limited expertise:** Internal team lacks specialised sustainability skills.	**Capacity Building** Engage external consultants, fund certification training, join peer networks, and review case studies.

Common Barriers	Practical Solutions
Competing Priorities **Operational demands:** Immediate needs overshadow long-term green goals.	**Strategic Alignment** Integrate sustainability into core KPIs, secure executive sponsorship, and target quick wins.
Measurement Issues **Quantifying impact:** Difficulty tracking and verifying performance data.	**Data Automation** Implement automated monitoring, benchmarking tools, standardised metrics, and regular reporting.
Supply Chain gaps **Product availability:** Limited access to certified green products/materials.	**Supplier Partnership** Early supplier engagement, alternative vendors, bulk purchasing coalitions, and long-term contracts.
Regulatory Flux **Changing codes:** Uncertainty around evolving standards and compliance.	**Proactive Compliance** Form regulatory committee, design for flexibility, build over-compliance buffer, and advocacy.

Risk Assessment Matrix

Implementation challenges, impact analysis, and mitigation strategies



Systematically evaluate environmental and health risks by combining the likelihood of occurrence with the severity of impact, to enable healthcare facilities to prioritise mitigation actions and improve sustainability, safety, and climate resilience.

1	2	3	4
Critical Risk	High Risks	Medium Risks	Low Risks

Risk Categories

Financial · Technical · Operational · Regulatory · External

ID	Risk Description	Category	Prob	Imp	Score	Current Controls	Mitigation Strategy	
R09	**Compliance Failures** Changes in local green building codes	REG	H	H	9	Annual compliance audit	Establish Regulatory Monitoring Committee Subscribe to code update alerts	Legal Dept
R01	**Budget Overruns** Material cost increases >15%	FIN	H	M	6	10% Contingency fund	Increase contingency to 20% Lock in supplier contracts early	Finance Lead
R04	**Integration Failures** Legacy BMS incompatibility	TECH	M	H	6	Vendor assessment	Pilot testing phase required Budget for middleware solutions	IT Director
R02	**ROI Delays** Payback period extends >12mo	FIN	M	H	6	Conservative modelling	Apply for utility rebates/grants Phase implementation to match savings	CFO
R08	**Staff Resistance** Low adoption of new protocols	OPS	M	M	4	Training sessions	Launch "Green Champions" programme Incentivize compliance behaviour	HR Lead

Monitoring & Reporting Framework

Tracking implementation, ensuring accountability, and enabling continuous learning

Monitoring and Reporting Framework

The Kenya Green Health Guidelines emphasize the importance of implementation, monitoring, and evaluation in achieving sustainable healthcare. By providing clear performance indicators, reporting mechanisms, and continuous improvement processes, the guidelines help health facilities track progress, ensure accountability,

Institutional Roles
Who Reports & When

Monitoring and reporting on green healthcare shall be undertaken through a coordinated multi-level structure that builds on existing health information and climate reporting systems.

Facility & Community Levels
Monthly Reporting

Collect data on indicators, conduct audits, and maintain resource logs. Empower community health promoters (CHPs) to green households

County Level
Quarterly Review

Compile facility data, verify reports, and integrate into CIDPs and County Health Plans.

National Level (MoH)
Annual Report

Aggregate national data, analyse trends, and publish status reports. Integrate findings into NCCAP, NDC, and SDG reporting.

Key Indicators
Metrics Across Themes

Monitoring to focus on both process & outcome indicators that measure environmental performance, efficiency, and resilience.

Resource Efficiency
Energy & Water

Energy consumption (kWh/bed), Water use (m^3/patient), % Renewable energy.

Waste Management
Circular Economy

% Waste segregated at source, % Treated via non-burn technologies.

Supply Chain & Transport
Procurement

% Green tenders awarded, Fleet emissions reduction, Chemicals phased out, %reduction in use of listed hazardous materials.

Governance
Leadership

Functional Green Teams, Sustainability policies in place.

Green building
Facilities

% facilities meeting green building standards

Monitoring Tools & Platforms
Enabling Systems

Monitoring shall utilise standardised tools and digital platforms to ensure consistency, reliability, and ease of aggregation

Data Systems
- Health Information System (HIS)/DHIS2 dashboards for electronic data entry and reporting.
- Integrated healthcare dMRV tool, used as a resource allocation tool
- Environmental and Resource Use Logs for water, waste, and energy tracking.

Assessment Tools
- Sustainability Audit Checklist for assessing facility-level performance.
- Adaptation and adoption of carbon accounting tools

Feedback Loops
- Annual Sustainability Scorecard to track progress and benchmark facilities.
- Community and Staff Scorecards for qualitative feedback on sustainability interventions.

Facilities to maintain documentation for verification and quality assurance during audits and supervision visits.

Green Readiness Assessment (GRA): Interactive self-evaluation tool to measure current sustainability maturity

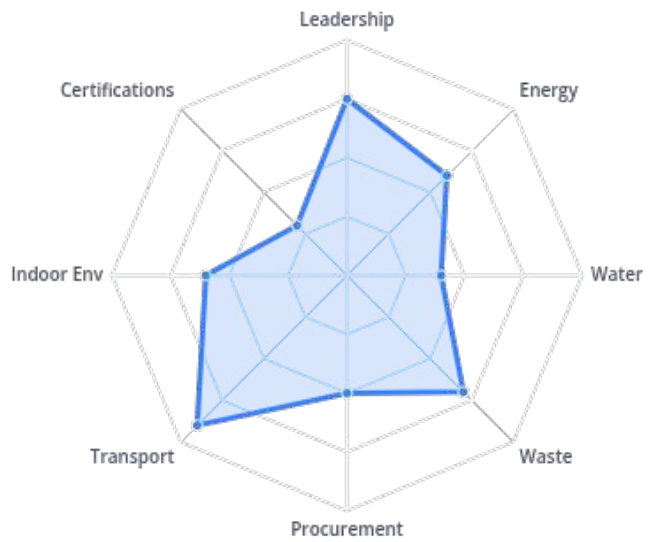
Leadership & Governance	15/20	Advanced
Energy Management	12/20	Developing
Water Efficiency	8/20	Developing
Waste Management	14/20	Advanced
Sustainable Procurement	10/20	Developing
Transportation & Mobility	18/20	Leader
Indoor Environment	12/20	Developing
Certifications & Reporting	6/20	Beginning

1. Energy audit completed within last 3 years	4 pts
2. Automated benchmarking system in place	4 pts
3. High-efficiency HVAC & Lighting installed	4 pts
4. Renewable energy procurement plan (>20%)	0 pts

95/160

Total Assessment Score

ADVANCED
Level 3 of 4



Priority Next Steps

- **Certifications Gap:** Initiate ENERGY STAR or LEED feasibility study to establish formal framework.
- **Water Conservation:** Conduct comprehensive water audit to identify leak & fixture upgrade opportunities.
- **Renewable Strategy:** Develop business case for on-site solar or PPA to boost Energy score.

Performance Dashboard

Key Performance Indicators & Success Metrics

Energy Performance

78
ENERGY STAR

35%
↓ kWh Usage

45%	128	-22%
Renewable	EUI (kBtu/sf)	Carbon

Water Efficiency

2.1M
Litres Saved
↓ Annual

65%
Recycling Rate

28%	12.5	4
Reduction	Lit/Occupant	Projects

Waste Diversion

68%
Diversion Rate

42%
Composting

125	32%	Zero
Tons Diverted	Landfill	E-Waste

Financial Impact

$450K
Annual Savings
↑ 12% YoY

18%
ROI

4.2yr	$1.2M	3x
Payback	NPV (10yr)	Grant Multiplier

Occupant Comfort

92
IAQ Score

+12%
Productivity

88%	4.8/5	-15%
Thermal Comfort	Feedback	Complaints

Certifications

GOLD
LEED Status
Certified

90%
Goals Met

85	WELL	ISO
Energy Star	Silver	14001

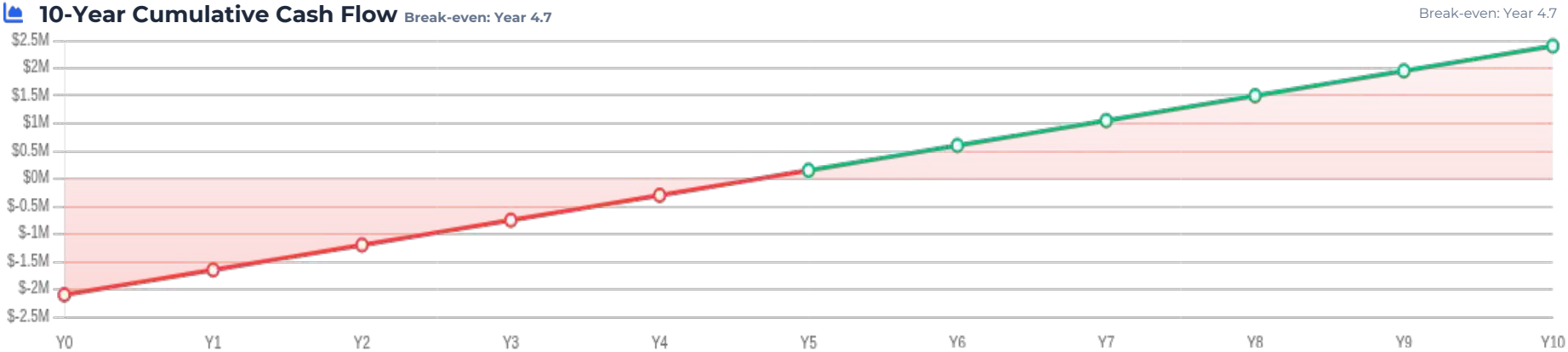
82/100 **Overall Sustainability Index**
Facility is performing in the top 20th percentile of peer group

On Track (≥80%) · Warning (60-79%) · Attention (<60%)

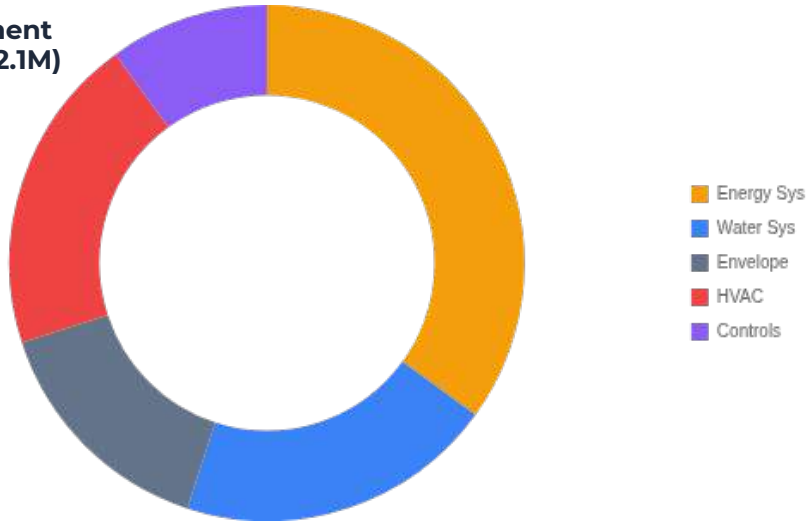
Cost-Benefit Analysis

Financial impact, investment breakdown, and long-term value projection

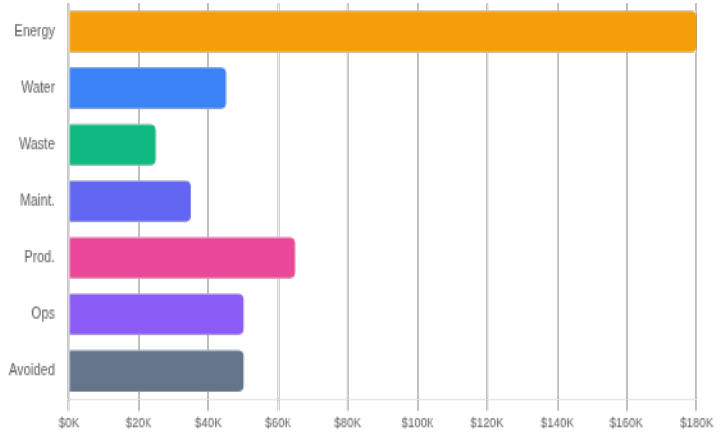
10-Year Cumulative Cash Flow Break-even: Year 4.7



Initial Investment Breakdown ($2.1M)



Annual Savings Breakdown ($450K/yr)



Total Investment	Annual Savings	Simple Payback	10-Year ROI	NPV @ 5%	IRR
$2.1M	$450K	4.7 Yrs	215%	$1.8M	18%
Upfront cost	↑ Recurring	Break-even point	High return	Positive value	Internal Rate

ROI Calculator and Scenarios

Investment payback analysis for different implementation scales

Methodology: Simple Payback = Initial Investment ÷ Annual Savings | ROI % = (Total Savings - Investment) ÷ Investment × 100 | NPV Discount Rate: 5% over 10 years

Scenario A: Small

140% ROI

LED Upgrades + Sensors

$50,000
Initial Cost

Annual Savings: $12K

• Energy • Maint • Prod

Payback Period: 4.2 Yrs

NPV (10yr): $70,000

IRR: 20%

Scenario B: Medium

160% ROI

HVAC + Controls

$250,000
Initial Cost

Annual Savings: $65K

• Energy • Maint • Other

Payback Period: 3.8 Yrs

NPV (10yr): $285,000

IRR: 22%

Scenario C: Large

153% ROI

Comprehensive Retrofit

$750,000
Initial Cost

Annual Savings: $190K

• Energy • Water • Waste

Payback Period: 3.9 Yrs

NPV (10yr): $920,000

IRR: 21%

Scenario D: Major

215% ROI

Full Transformation

$2.1M
Initial Cost

Annual Savings: $450K

• Energy • Prod • Ops

Payback Period: 4.7 Yrs

NPV (10yr): $1.8M

IRR: 18%

Scenario	Investment	Annual Savings	Payback Period	5-Year Return	10-Year Return	10-Year ROI	IRR
A: Small (LED)	$50,000	$12,000	4.2 Years	$60,000	$120,000	140%	20%
B: Medium (HVAC)	$250,000	$65,000	3.8 Years	$325,000	$650,000	160%	22%
C: Large (Retrofit)	$750,000	$190,000	3.9 Years	$950,000	$1.9M	153%	21%
D: Major (Transform)	$2.1M	$450,000	4.7 Years	$2.25M	$4.5M	215%	18%

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Annex 1: List of Climate Change and Health Taskforce

S/N	Name	Organisation	Role
1	Adan G. Harakhe, HSC	Ministry of Health	Chairperson
2	Dr. Grace Ikahu – Muchangi	Ministry of Health	Member
3	Dr. Stephen Muleshe	Ministry of Health	Member
4	Dr. Peter Kimuu	The National Treasury	Member
5	Anthony Wainaina	Ministry of Health	Member
6	Dr. Naomi Mutie	Ministry of Health	Member
7	Dr. Martin Muchangi	Amref Health Africa	Member
8	Jan Geleijnse	UNICEF KCO	Member
9	Geoffrey Korir	Embassy of the Kingdom of the Netherlands in Kenya	Member
10	Hannah Muroki	Embassy of the Kingdom of the Netherlands in Kenya	Member
11	Dr James Dan Otieno	World Health Organisation	Member
12	Lolem Lokolile Bosco	Ministry of Health	Secretariat
13	Rose Mokaya	Ministry of Health	Secretariat
14	Emilly Obudho	Ministry of Health	Secretariat
15	Cyrus Karanja	Ministry of Health	Secretariat
16	Moses Lengewa	Amref Health Africa	Secretariat
17	Sarah Kosgei	Amref Health Africa	Secretariat
18	Arch. Nickson Otieno	Niko Green	Consultant
19	Esther Ishuga	Niko Green	Consultant
20	Gladys Ngeno	Independent Consultant	Consultant

Annex 2: List of stakeholders involved

	Organisation	Name(s)
1	Ministry of Health	Fredrick M. Muli
		Caren Sang
		Diana Amase
		Cyrus Karanja
		Victoria Ndanu Samson
		Martin Kamuki
		Catherine Munyao
		Catherine Silali
		Sarah Gathu
		Bradford Sikali
		Kimutai Boit
2	Kenya Medical Research Institute (KEMRI)	Dr. James Mwitari
		Sophie Matu
		Gohole Arthur
		Kevin Kemboi
3	Niko Green	Azarius Karanja
		Christine Amondi
		Isaac Kangwony
		Elizabeth Mutua
		Francis Mugo
		Javans Wanga

	Organisation	Name (s)
4	State Department of Public Works	Kennedy Matheka
5	County Government of Makueni	Dr. Caroline Kaeni
6	Nairobi City County Government	Raphael K. Muli
7	Migori County Government	Erick Kevin
8	Taita Taveta County Government	Elvis Mwandawiro
9	County Government of Marsabit	Roba Golicha
10	County Government of Samburu	Timothy K. Lendrop
11	County Government of Nyandarua	Hellen Njeri Njoroge
12	National Environment Management Authority (NEMA)	Dr. Jusper N. Omwenga
13	Kenyatta University Teaching, Research, and Referral Hospital	Felix Karani
14	Nakuru County Referral Hospital	Vhanice Kwamboka
15	Council of Governors (CoG)	Meboh Abuor
		Robert Rapando
		Sheila Yoto

	Organisation	Name (s)
16	Kenya Medical Training College (KMTC)	Dr. Kelly Oluoch
		Lucy Chebungei
17	M.P. Shah Hospital	Dr. Toseef Din
		Dr. Joan Osoro
		Yvonne Kirigo
		Eng. Millicent Alooh
18	Egerton University	Prof. Samson Obure
19	Public Health Officers & Technicians Council	Anthony Wainaina
20	Kenya Medical Women's Association	Dr. Christine Sadia
21	Kenya Medical Association (KMA)	Dr. Dave Ojijo
22	Kenya Medical Supplies Agency (KEMSA)	Peter Mwangi
		Irene Wachira
23	Clinical Officers Council of Kenya	Eunice Kuria
24	Kenya Medical Laboratory Technicians and Technologists Board (KMLTTB)	Raphael Gikera
25	Christian Health Association of Kenya (CHAK)	Zilpha Samoei
26	Kenya Healthcare Federation (KHF)	Lucy Wanjohi
27	Association of Public Health Officers of Kenya (APHOK)	Mohamed Duba
		Irene Kirui
		Joseph Kilel
28	Kenya Association of Pharmaceutical Industry (KAPI)	Stella Kiptanui
		Loice Felice

Annex 2: List of stakeholders involved

	Organisation	Name(s)
29	Mission for Essential Drugs & Supplies (MEDS)	Mariana Mercy Takah
30	Association of Kenya Insurers (AKI)	William Kiama
31	University of Kabianga	Dr. Faith Onyangore
32	Moi Teaching and Referral Hospital	Andrew Bowen
33	Phoenix Climate and Health Associates	Solomon Nzioka
34	Spectrum Africa	Justus Ogando
35	Kenyatta University	Christine K. Wachira
36	Endelevu Labs	Felix Omondi
37	Africa Population Health Research Centre (APHRC)	Dr. Timothy Abuya
38	PharmAccess	Millicent Olulo
		Merilyn Ommeh
39	Rural & Urban Private Hospitals Association (RUPHA)	George Mbugua
40	Gertrudes Hospital	Carol Waweru
		Baraka Kerich
41	Kenya Red Cross Society	Peter Murgor
42	Strathmore University	Dr. Churchil Saoke
		Teddy Nabulega

	Organisation	Name(s)
43	Pit to Palace	Wanjiru Kiare
		Margaret Sande
44	Africa Research Impact Network (ARIN)	Anne S.W. Irungu
		Washington Kanyagi
45	National Institute for Public Health and the Environment (RIVM)	Joris Sprokholt
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47	Jamii Yangu Africa	Wilkins Mboha
		Aquila Oyange
48	University of Nairobi	Nancy Mueni
49	Science Africa	Miliam Murigi
50	Aga Khan University Hospital Nairobi	Caroline Muthoni
51	Philips East Africa Limited	Dr. Muthoni Ntonjira
52	Willok Associates	Prof. William O. Ogara
53	Avocet Management Centre	Cynthia Nyaoro
54	Population Council of Kenya	Jacinter Amadi
55	NAW & Health Centre	Victor Rutto
56	Energy and Petroleum Regulatory Authority (EPRA)	Ronald Ketter
57	Kenya Environmental Health Practitioners' and Public Health Professionals Union (KEHPHPU)	Wairimu Joyce
58	Pharmacy and Poisons Board (PPB)	Symon Lolgisoi

Kenya Green Health Guidelines

Towards low-carbon, climate-resilient, and sustainable health systems

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