IMPLEMENTATION FRAMEWORK

HEALTH & ENVIRONMENT

Health Care Without Harm

ARUP

This work is the result of a collaboration between Health Care Without Harm (HCWH) Europe, ARUP and the health and environment administrations of the National Environment and Health Action Plan:

- FOD Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu
- Departement Zorg
- Departement Omgeving
- Leefmilieu Brussel
- Vivalis
- Agence Wallonne pour une vie de qualité (AViQ)
- Service public de Wallonie
- Ministerium der deutschsprachige Gemeinschaft

Contents

Introduction to document

This report is an implementation framework designed to support the Belgian health care sector with actionable guidance for responding to the recommendations and opportunities outlined throughout this project. This framework aims to translate these into practical and measurable actions, ensuring alignment with the emissions reduction trajectory 'zone'. It defines Key Performance Indicators (KPIs) that align with the HCWH's seven high-impact Action areas[1], allowing for systematic tracking of progress and evidence-based evaluation of impact. Additionally, this implementation framework emphasises the importance of data-driven decision making, proposing improved data collection for accurately measuring sectoral emissions and quantifying the effectiveness of decarbonisation intervention at the facility, regional, and national levels. It is intended to serve as a reference and guide during the development of detailed decarbonisation programmes across the health system, at the regional and provincial levels.

This action plan complements previously issued reports, following the development of an emissions baseline, creation of future emissions trajectories, and model of emissions reductions interventions against an emissions reduction trajectory 'zone'. It outlines practical steps to plan and implement potential solution areas, discussing how pilot programmes, business case analysis, and feasibility assessments can deliver change. Outlined below are deliverables that should be used as companion resources to this report:

- The emissions baseline deliverable (*the published report "greenhouse gas emissions of the Belgian health care sector"*) contains a description of the methodology, assumptions and limitations used to establish the emissions baseline and business-as-usual (BAU) trajectory. A baseline emissions inventory was compiled to reflect the health care sector's annual direct and indirect Greenhouse Gas (GHG) emissions, and from which targeted actions and interventions can be identified, prioritised, and modelled. Results from the charts included in the emissions baseline have also been provided in a tabular format (*see published Excel document "Reporting and Implementation results"*).

- The *Belgian roadmap for health care decarbonisation* its technical annex provide a summary of the inputs, methodology, assumptions, and limitations used in conducting the steps described above. Tabular and graphical results are also provided in the reports.

This report is structured as follows:

- Section 1 introduces the report and summarise the deliverables to accompany this report.
- Section 2 outlines the key findings from Belgium's health emissions baseline and Roadmap, including the most promising intervention areas, and a summary of the main related policy measures in Belgium.
- Section 3 presents the governance and stakeholder engagement required to decarbonise Belgium's health sector.
- Section 4 highlights the seven Action areas focused on key strategic areas that collectively address the entire health care value chain, disaggregated by short-, medium-, and Long-term initiatives.
- Section 5 outlines the monitoring and evaluation of the action plan, highlighting the impact delivered by the actions towards reducing greenhouse gas emission in Belgium's health sector.
- Section A.1 details the Action areas, initiatives steps, and stakeholders that would be most relevant to each Action area.

Background and context

1.1   Belgium's health care emissions profile

Belgium's health sector emissions in 2022 totalled to 9,901 $ktCO_2e$, contributing approximately 5% to the country's totally consumption-based emissions and reflecting an emissions intensity of 0.16 $kgCO_2e$/EUR. This baseline, developed using a hybrid approach combining top-down expenditure data and bottom-up activity data, provides a view of emissions by scope and source. The emissions breakdown highlights the predominance of Scope 3 emissions, which account for 86% of the sector's total emissions. Scope 1 emissions make up 11% and Scope 2 emissions 3%, with direct facility operations and energy use being major contributors.

Without intervention, emissions in the health sector are projected to increase by over 60% by 2050, considering both anticipated growth in sector activity and trends surrounding wider economic decarbonisation. Given the projected growth trajectory, Belgium's health sector requires a decisive shift to align with national and EU climate goals, including the 55% reduction in emissions by 2030 under the European Green Deal[2] and full decarbonisation by 2050.

1.2   Decarbonisation potential and interventions

Analysis within the roadmap report has shown that the health sector has the potential to reduce emissions by approximately 73% in 2050 relative to projected emissions under a business-as-usual scenario through adopting 16 interventions. These include actions across direct health care operations, the supply chain, and indirect emissions linked to wider societal decarbonisation. Even with these efforts, residual emissions are expected to be around 4,323 $ktCO_2e$, indicating the need for additional innovations, enhanced policy support, and cross-sector collaboration to achieve net-zero ambitions.

- **Decarbonise health care delivery, facilities, and operations**: Facility and operational interventions stand out as promising areas, with the potential to reduce Belgium's health care sector's Scope 1 and 2 carbon footprint by 99% from the 2022 baseline by 2050. Targeting emissions from operating facilities and vehicles through encouraging behavioural change and optimisation, refurbishment, electrification, and renewables can significantly decarbonise these emissions.

- **Decarbonise health care's supply chain**: This analysis has shown that 86% of Belgium's health care's climate footprint is made up of Scope 3 emissions associated with purchased goods and services. Belgium's health sector can drive carbon reductions in its supply chain by demanding decarbonisation across the production, transport, consumption, and disposal of health care products, and reducing overconsumption by implementing best practices in health care delivery. Wider impacts across the value chain that can be achieved through rigorous procurement standards applied by the end consumer of products: the health system. While the sector can drive change, the extent to which suppliers achieve targets is unknown. Supply-side action is the most impactful of all those considered in this analysis, which assumed 70% of suppliers successfully achieve a 90% decarbonisation target.

This action plan outlines how policymakers and stakeholders can prioritise and structure these efforts to accelerate the transition to a low-carbon health care system.

1.3   Alignment with national and EU policies

Belgium's health sector decarbonisation roadmap is supported by national policies and EU-level directives, providing a policy environment conducive to sustainability efforts.

Under the European Union's European Green Deal[2] and Climate Law[3], Belgium is committed to contributing to achieve net-zero emissions by 2050. This commitment has spurred sectoral policies aligned with Belgium's climate action targets, such as the Energy Efficiency Directive[4], the Circular Economy Action Plan[5], and the EU Pharmaceutical Strategy[6], each of which has implications for emissions reduction in the health care sector.

At national level, key frameworks, such as the National Energy and Climate Plan (NECP)[7] and the National Environment and Health Action Plan (NEHAP3)[8], integrate low-carbon and climate resilience commitments for health care. At the regional level, plans such as the Wallonia Plan Air Climat Énergie[9], the Flemish climate & Health plan[10] (chapter 4. NetZero Health care) and the Climate Plan Flemish Infrastructure Fund for Person-

related affairs (VIPA)[11], the Flemish climate and energy plan[12], and the Brussels Air Climate Energy Plan[13] reinforce these objectives, helping to drive the health sector's transition toward decarbonisation.

Given the importance of the decarbonisation roadmap for the health care sector, it is advisable for the adoption process to include a public consultation to ensure transparency and gather feedback from relevant parties. The process may also include guidance and coordination from the National Climate Commission (CONCERE-CNC PNEC 2030 or NOVER-NKC NEKP 2030) to align with the preparation of the National Energy and Climate Plan (NECP)[7].

1.4 Establishing a health-specific decarbonisation target

Belgium's commitment to contribute to net-zero emissions in Europe by 2050, as outlined in the National Energy and Climate Plan (NECP)[7], provides a strong framework for sector-specific targets across all key sectors, including health care. Establishing a targeted decarbonisation objective for the health care sector can ensure alignment with national climate commitments, drive sector-specific innovations, and protect health outcomes by improving resilience to climate impacts.

Belgium should consider setting its own targets which could consider treating direct emissions from facilities (scope 1), indirect emissions from energy use (scope 2), and wider emissions throughout the supply chain (scope 3) separately. Phased targets to guide health care sector emissions reduction over the short, medium, and long term are recommended. The targets should serve as guiding benchmarks, tracking emissions reduction progress across health care operations, infrastructure, procurement, and service delivery.

Governance and stakeholders

Achieving Belgium's health sector decarbonisation goals requires effective governance and stakeholder engagement with the Belgian health system.

1.5 Governance framework

The governance structure for implementing the roadmap builds on Belgium's existing climate and health frameworks, integrating the requirements and ambitions of the National Energy and Climate Plan (NECP), the National Environment and Health Action Plan (NEHAP3)[8], and the European Green Deal[2]. The framework is designed to ensure multi-level coordination, transparency, accountability, and adaptive management as the roadmap evolves.

- **Steering Committee**: The committee should serve as the central oversight body for implementing the roadmap. It should include representatives from federal and regional governments with a clear delineation of responsibilities of federal, regional and local authorities. It should oversee a structural budget dedicated to health care sector decarbonisation, ensuring adequate and sustainable funding mechanisms. It is recommended for the Working Group on Low Carbon and Sustainable Health System to take up this role.

- **Coordination Unit**: A coordination unit should lead implementation efforts, working closely with the Steering Committee to set sectoral targets, monitor progress, and adjust interventions as necessary. The unit should coordinate with other federal and regional bodies to implement specific policies supporting health care decarbonisation, including energy efficiency standards, renewable energy integration, and procurement requirements.

- **Regional and Local Authorities**: Belgium's regional governments (Flanders, Wallonia, and Brussels-Capital) will need to play a significant role in implementing policies and actions at the regional level. Regional health authorities should coordinate with other administration departments for developing and adopting regional health care decarbonisation roadmaps, tailoring interventions to regional contexts and providing local health care facilities with technical assistance and resources. A clear definition of which responsibilities of greenhouse gas reduction actions fall under which political powers and their associated administrations, with attention to cross-collaboration to meet the targets is necessary.

- **Climate and Health Expert Group**: This expert group, composed of selected industry and civil society experts in health care, sustainability, and climate action, should support the Coordination Unit and regional and local authorities with technical guidance. Its mandate could include developing decarbonisation guidelines and advising on best practices for health care facilities and the broader health system to transition to low-carbon operations.

1.6 Stakeholder engagement and roles

A collaborative approach is essential to drive sector-wide decarbonisation. The following stakeholders should play critical roles in achieving the roadmap's goals:

- **Health care providers**: As primary actors in implementing the roadmap, health care providers would be responsible for incorporating low-carbon practices in daily operations. This should be done through the development of climate transition plans with board-level oversight and executive management accountability. These climate transition plans should include credible elements of a climate transition plan including robust governance, scenario analysis, financing planning, value chain engagement, risks and opportunities, science-based targets, and scope 1, 2 and 3 accounting and verification.[i]

- **Industry and supply chain partners**: Given that most of the sector's emissions are from scope 3 emissions, active participation from pharmaceutical companies, medical device manufacturers, food and service providers, and other suppliers will be important for the successful implementation of the roadmap. These partners are expected to establish their own climate transition plans [ii] and meet procurement requirements

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[i] For guidance refer to the CDP Technical Note: Reporting on Climate Transition Plans. Hospitals in Belgium may fall under the scope of the Corporate Sustainability Reporting Directive (CSRD) and will be reporting according to the European Sustainability Reporting Standards.

[ii] Companies subject to the CSRD will be reporting according to the European Sustainability Reporting Standards

aligned with the roadmap. Collaboration with these partners will be required to enable the health care sector to reduce its carbon footprint across the supply chain.

- **Financiers and investors**: Financiers and investors, including banks, insurers, asset managers and private equity firms, play an important role in financing Belgium's health care infrastructure. These stakeholders will increasingly be subject to EU regulations,[iii] which mandate the consideration of sustainability criteria into their financing models, including when financing hospital projects, care facilities, or medical innovations. Private investment should be complemented by blended finance, thematic bonds, sustainability-linked bonds and other innovative financing mechanisms to address upfront costs and facilitate large-scale decarbonisation across the sector.

- **Professional associations and unions**: Associations representing health care professionals and unions should have an advocacy role, promoting awareness of the roadmap's goals and supporting the training and engagement of health care workers in sustainable practices. These organisations can also facilitate feedback from health care workers, ensuring that the roadmap's interventions are realistic and that workplace concerns are addressed.

- **Patients and the public**: Public engagement is an important component of the governance structure, especially as the health care sector adopts sustainable practices that may impact service delivery. A public consultation phase is recommended to gather input and ensure transparency in the roadmap's development and adoption. This could help build public support, foster understanding of the health care sector's role in decarbonisation, and engage patients in reducing emissions from health care delivery (e.g., through telemedicine options).

- **Non-governmental organisations and civil society groups**: Academics and scientific advisors environmental and public health NGOs along with civil society groups, could act as key advocates for sustainable health care practices, pushing for ambitious targets and accountability. These groups can support public awareness campaigns, advocate for vulnerable populations impacted by climate change, and monitor progress towards achieving emissions reduction goals. In addition, they could also conduct research to identify and develop sustainable health care practices. They can further educate and train health care professionals on the importance of sustainability in health care.

1.7 Accountability and reporting

Clear accountability and regular reporting are needed to track progress, ensure transparency, and maintain stakeholder engagement. The following reporting mechanisms are proposed:

- **Regular progress reports**: The Coordination Unit should publish regular progress reports (every 1-2 years) detailing emissions reductions, achievements, and challenges encountered during implementation. These reports should be shared with all stakeholders and made publicly available to ensure transparency.

- **Performance reviews**: The Steering Committee should conduct biannual performance reviews to assess progress and identify areas where interventions may require adjustment. These reviews should include input from regional authorities, the Climate and Health Expert Group, and health care providers.

- **Open data-driven reporting**: Establishing monitoring systems to track emissions reductions, energy usage, and waste management practices at the facility level, supported by open data practices and interoperable data standards is highly recommended. This would ensure transparency, accessibility, and data integration across reporting entities.

1.8 Capacity building and financial support

Dedicated programmes for capacity building and technical support should be put in place to implement the roadmap:

- **Training and development**: Implementing decarbonisation strategies requires health care workers to be trained in sustainable practices. The roadmap should include establishing training programmes for (facility) managers, (medical) staff, leadership, and procurement teams, equipping them with skills in energy efficiency, sustainable procurement, and waste reduction.

[iii] Financiers and investors will be subject to the CSRD and SFDR and will report against the EU Taxonomy Regulation

- **Funding and incentive programmes**: Financial incentives and grants would be crucial for health care facilities investing in decarbonisation efforts. Regional authorities should manage structural budgets and work with finance providers to finance the implementation of interventions.

1.9   Future revisions

The roadmap and action plan should be regularly updated based on emerging technologies, policy shifts, and progress toward interim targets. An implementation programme, guided by periodic evaluations, would ensure the roadmap remains relevant and effective over time. A formal review every 2-3 years is necessary, during which stakeholders should assess achievements, refine targets, and update interventions to reflect the evolving climate landscape.

Action areas

Achieving a zero-emissions health care system in Belgium demands bold, cross-cutting actions focused on key strategic areas that collectively address the entire health care value chain. This decarbonisation action plan introduces seven targeted actions for federal and regional health authorities and other key stakeholders to respond to the findings of the emissions baseline and decarbonisation roadmap for the Belgian health system. For many of these action areas existing policies and initiatives may be in place that contribute towards decarbonisation and should be assessed when reviewing opportunities and implementation approaches.

These actions are focussed on delivering a decarbonised health system. It should also be recognised that the scale of the system is driven by the needs for health services within Belgium, and that the potential to reduce sector emissions through measures that reduce the burden of disease is potentially great. While this action plan does not focus on public health approaches addressing the causes of ill-health, such measures can play a crucial role in reducing the environmental impact associated with the sector.

By implementing the initiatives detailed across these seven areas, significant progress can be made towards a zero-emissions future, setting an example in sustainable health care practices for other sectors and nations to follow. The seven decarbonisation action areas are described in Table 1.

Table 1: Decarbonisation Actions Areas for the Belgian Health Sector

#	Action area name	Emissions scope	Description
1	**Power health care with 100% clean, renewable electricity**	1, 2	Ensure that health care is powered by zero emissions electricity, either generated onsite or purchased from offsite suppliers.
2	**Invest in zero emissions buildings and infrastructure**	1, 2	In existing and newly developed assets, ensure that every health care building and their infrastructure is used effectively, energy efficient, and zero emissions. Encourage energy efficiency among building managers and staff.
3	**Transition to zero emissions, sustainable travel, and transport**	1, 2	Reduce the number of vehicles, optimize their usage, transition to a zero-emission fleet and infrastructure, while promoting active mobility and public transportation for staff, patients, and visitors (including through targeted awareness initiatives and the development of appropriate infrastructure).
4	**Provide healthy, sustainably grown food and support climate resilient agriculture**	3	Provide nutritious, low-carbon, and sustainably sourced food with minimised food waste for both staff and patients.
5	**Incentivise and produce low-carbon pharmaceuticals**	3	Reduce the carbon footprint of pharmaceutical production and usage by promoting sustainable manufacturing practices and minimising unnecessary pharmaceutical use.
6	**Implement circular health care and sustainable health care waste management**	3	Implement circular economy principles to shift procurement approach (Incl. local and PME sourcing), make material strategies more resource efficient, reduce the volume and toxicity of waste, and manage waste more circularly.
7	**Establish greater health system effectiveness, eliminating inefficient and unnecessary practices**	1, 2, 3	Reduce emissions by enhancing health system effectiveness, removing wasteful and unnecessary practices, integrating carbon reduction with quality of care.

To effectively deliver upon each Action area, progress against a suite of associated actions is required. Maximising cost-effectiveness and carbon reduction impact requires a comprehensive approach to tracking emissions across health care delivery. This baselining provides a foundation for identifying the most impactful decarbonisation actions to be deployed under each action area, tailored to the unique operational and logistical context of the sector.

Thus, **rather than prescribing fixed actions under each action area, this action plan outlines a systematic, evidence-based approach to decarbonisation**. It details the necessary steps to **progress from baselining and intervention identification to targeted piloting and scaling**. This phased approach ensures that each action is piloted and refined, enabling scaling of effective solutions that align with both cost and environmental goals. In following this structured pathway, the Belgium health sector can build a resilient, sustainable system that accelerates progress toward zero emissions, while optimising resource use.

1.10 Action area 1: Power health care with 100% clean, renewable electricity

Goal: Ensure that health care is powered by zero emissions electricity, whilst leveraging demand-side flexibility to enhance energy resilience.

Typical actions:

- Onsite renewable generation (e.g., solar photovoltaics or wind)
- Onsite battery storage
- Power Purchase Agreements (PPAs)
- Renewable Electricity Certificates (RECs)
- Demand-side management strategies, including advanced load monitoring and control

Relevant policies:

- EU: Renewable Energy Directive (RED)[14] and Energy Efficiency Directive (EED)[4]
- Federal and regional: National Energy and Climate Plan (NECP)[7], Wallonia Climate and Energy Plan (PACE), Flanders Energy and Climate Plan 2021-2030[12], Flemish Climate Strategy 2050[15], Green deal klimaatbestendige omgeving[16], Brussels' Air, Climate, and Energy Plan[13], the Climate plan Flemish Infrastructure Fund for Person-related affairs (VIPA)[11]

1.10.1 Short-term initiatives

Building stock renewable electricity diagnosis, typology and benchmark setting: To effectively screen, prioritize, pilot, and scale actions aimed at increasing renewable electricity supply, a detailed inventory of renewable electricity consumption as a share of total electricity consumption in health care sector buildings must be established. This inventory should also include data on current energy usage patterns, building energy flexibility, and peak demand loads to enable integration of demand-side management strategies. Facilities with lower renewable energy usage and lower energy flexibility should be prioritized for targeted actions to address gaps and improve energy resilience.

Renewable electricity action screening for both new and existing assets: Once developed, a facility inventory should support the systematic assessment of actions to increase the share of renewable electricity used in both existing and newly constructed health care institutions. This screening should evaluate potential renewable electricity generation and procurement strategies, such as onsite renewable generation (e.g., solar photovoltaics or wind), battery storage installations, and offsite renewable energy procurement through Power Purchase Agreements (PPAs) or Renewable Energy Certificates (RECs), as well as demand-side flexibility measures such as load shifting, peak shaving, and intelligent energy storage use.

Potential outcomes:

- A comprehensive asset database detailing each building's typology, age, current percentage of renewable energy in electricity consumption, and peak load profiles.
- Defined benchmarks that distinguish good and poor renewable electricity performance and demand-side energy resilience for each building type, enabling comparison across the sector.

- A clearer picture of underperforming facilities and opportunities for actions to boost renewable electricity use and demand-side energy resilience.
- A prioritised list of action opportunities for each facility typology.
- Cost-benefit analyses for identified actions, supporting data-driven decision-making for renewable electricity and demand-response capability investments.

1.10.2   Medium-term initiatives

Pilot testing of renewable electricity actions: Following the identification of priority action, pilot tests should be deployed as a means to assess the potential effectiveness of more widely rolling out the priority actions. For ease of analysis, pilots should be designed to evaluate implementation feasibility, indicative costs, resourcing requirements, and scalability. A phased pilot testing model could allow for mid-term evaluations and adaptations based on preliminary results.

Expected outcomes:

- Insights into real-world costs, operational requirements, and decarbonization impacts of various renewable electricity and demand-side flexibility actions.
- An understanding of which actions are scalable across different types of health care facilities.
- Informed policy-making and budgeting based on tested actions, allowing for more targeted funding and support.
- A compelling evidence base for the broader adoption of renewable energy and flexible energy management practices in health care.

1.10.3   Long-term initiatives

Rollout of previously piloted renewable electricity actions: Successful pilot actions should be expanded across the health care sector, combining renewable energy integration with enhanced energy flexibility solutions to build a resilient, low-carbon system. Expansion should incorporate continuous monitoring and refinement based on feedback to adapt to evolving energy demands.

Scaling of renewable electricity action rollout to include more types of actions: Over time, the scope of heath care facilities that qualify for the actions should be scaled, adjusting actions iteratively with continuous feedback. It is also essential to gradually introduce, test and reinforce new types of actions previously not considered as high priority for decarbonisation.

Expected outcomes:

- A significant increase in the share of renewable electricity across the health care system, moving toward 100% clean energy.
- Improved energy resilience in health care facilities, ensuring uninterrupted operations under increasing electrification.
- Long-term operational cost savings from renewable energy and flexible load management.
- Robust, scalable energy management models transferable across different health care facility types.

1.11 Action area 2: Invest in zero emissions buildings and infrastructure

Goal: In existing and newly developed assets, ensure that every health care building and their infrastructure is used effectively, energy efficient, and zero emissions

Typical actions:

- Energy efficiency upgrades including lighting, HVAC systems, insulation and windows

- Fuel switching and heating electrification through district heating and heat pumps

- Smart energy management systems and demand-side management

- Low- or zero-emissions cold chain infrastructure, including vaccine storage and distribution facilities

- Low- or zero-carbon information and communications technology infrastructure including storage, efficient devices, and back up mechanisms

- Designing for optimised daylighting, natural and mixed mode ventilation, passive solar heating and cooling strategies, and reflective roofing or cool roofs

- Use of low-carbon, durable construction materials such as biobased materials, supporting biophilic design

- Adoption of building designs that are zero emissions, using green building accreditation tools and standards, supporting material efficiency

- Reutilisation or repurposing of building materials like steel girders in refurbishment projects.

- Adequate awareness-raising measures among staff on energy efficiency and energy sobriety

Relevant policies:

- EU: Energy Performance of Buildings Directive (EPBD)[17], Minimum Energy Performance Standards (MEPS)[18], Emission Trading System 2 for Buildings[19], EU Clean Heat Mechanism

    Federal and regional: Flemish Energy Performance of Buildings (EPB) Regulation[20], Plan Air Climat Énergie (PACE)[9], Brussels Energy Performance of Buildings Code (PEB)[21], the Flemish climate & Health plan (chapter 4. NetZero Health care)[10], the Climate plan Flemish Infrastructure Fund for Person-related affairs (VIPA)[11] and the Flemish sustainability criteria for Health- and wellbeing infrastructure, Flanders Energy and Climate Plan 2021-2030[12], Flemish Climat Strategy 2050[15], Green deal klimaatbestendige omgeving[16]

1.11.1 Short-term initiatives

Building and infrastructure stock GHG emissions diagnosis, typology and benchmark setting: A comprehensive stock-taking exercise of operational and embodied construction GHG emissions across health care facilities should provide a clear basis for the definition of performance standard. If this analysis is undertaken for a range of health care facilities, benchmarks can be established to define good and poor performance for different building and infrastructure typologies and their different system and fabric components. These benchmarks should consider alignment with both existing regulations and voluntary standards. Benchmarks enable the identification of priority assets, operational systems and construction components to target with decarbonisation actions.

Decarbonisation action screening in buildings and infrastructure retrofit and new build: Following the evaluation of building and infrastructure stock GHG emissions performance, it should be possible to undertake a systematic screening of potential decarbonisation actions for existing and new buildings and infrastructure within the Belgian health care system. This screening should enable the identification of high-impact actions to enhance energy efficiency, electrify energy systems, and adopt low-carbon and circular materials in construction for each building typology within the health care system

Potential outcomes:

- A data-backed understanding of the characteristics and performance of various building and infrastructure types, measuring compliance against the EPBD and other national, local, and voluntary building codes, ordinances or standards.

- Defined benchmarks that distinguish good and poor GHG emissions and energy efficiency performance for each building and infrastructure type, enabling comparison across the sector.

- A clearer picture of underperforming facilities and opportunities for decarbonisation and energy efficiency actions.

- Defined and prioritised actions to reduce emissions across typologies, enhancing decision-making for facility upgrades and new construction.

- A clear understanding of the resource needs, cost implications, and timelines for decarbonising assets, enabling more precise budgeting and resource allocation.

1.11.2   Medium-term initiatives

Pilot testing of building and infrastructure decarbonisation actions*: After potential actions to decarbonise health care buildings and infrastructure have been identified and characterised, action piloting can help to evaluate their impact regarding emissions reductions and compliance with building regulations; cost-effectiveness; feasibility of implementation; and scalability prior to wider deployment. Reflecting on the screening process, actions and assets should be prioritised for piloting which have the greatest predicted benefit in emissions reductions.

Potential outcomes:

- A refined understanding of the costs, resource needs, and logistical considerations of each action, reducing uncertainty in budgeting and planning for larger-scale rollouts.

- An appreciation of the relative effectiveness of priority actions in delivering meaningful emissions reductions and energy savings.

- Use pilot results to shape targeted policies, funding mechanisms, and incentives to support broader decarbonisation across health care facilities.

- Identification of the most effective, feasible, and scalable actions for reducing emissions in the Belgian health care system.

1.11.3   Long-term initiatives

Rollout of previously piloted decarbonisation actions: Following the successful piloting of decarbonisation actions, there should be a broader rollout of the most effective and feasible solutions across the Belgian health care sector, ensuring buildings meets NZEB standards and adhere to MEPS. The evaluation of emissions reductions, energy savings, cost-effectiveness, and operational impacts across the pilot schemes provides the evidence base for the judgement of which actions are most suitable to rollout at scale.

Scaling of renewable electricity action rollout to include more types of actions: The scope of health care facilities eligible for these actions should be progressively expanded, with adjustments made iteratively based on ongoing feedback. Additionally, it is important to gradually introduce, test, and strengthen new types of actions that were previously considered lower priority for decarbonisation.

Potential outcomes:

- Scaled deployment of high-impact actions across facilities, leading to substantial reductions in GHG emissions sector-wide.

- Enhanced energy efficiency and improved environmental sustainability across health care facilities.

- Creation of sector-wide protocols and practices based, providing consistent decarbonisation approaches across facilities.

- Streamlined processes for intervention rollout, being more cost-effective, quicker to implement, and better tailored to the needs of different asset types

1.12 Action area 3: Transition to zero emissions, sustainable travel and transport

Goal: Minimize the number of vehicles and encourage their efficient use, transition to a zero-emission fleet and supporting infrastructure, and foster active mobility and public transportation for staff, patients, and visitors through awareness campaigns and the development of suitable infrastructure.

Typical actions:

- Medical transport and emergency vehicles:
  - Transition to EVs.
  - Development of the necessary electric vehicle charging infrastructure to accommodate the needs of medical and emergency vehicles.
- Professional travel and homework travel:
  - Remote working flexibility policies.
  - Active and public transport use.
  - Carpooling incentives.
  - Business travel mileage limits and justification requirements.
  - Internal carbon pricing policy for business travel.
- User and visitor travel:
  - Mobility information points to encourage public and active transportation
  - Campaigns to promoting the health-environment co-benefits of sustainable travel.
  - Expansion and integration of telemedicine services to reduce the need for patient travel to health care facilities, thus minimizing the carbon footprint associated with in-person consultations.

Relevant policies:

- EU: Clean Vehicles Directive and Sustainable and Smart Mobility Strategy[22], Emissions Trading System 2 for Road Transport[19]
- Federal and regional: Federal Sustainable Mobility Policy, and the Regional Sustainable Transport Plans (e.g., Flanders' Mobility Plan[23], Brussels' Good Move Plan[24], Wallonia's Regional Mobility Strategy[25]; the Flemish climate & Health plan (chapter 4. NetZero Health care)[11], Flanders Energy and Climate Plan 2021-2030[12], Flemish Climat Strategy 2050[15], Green deal klimaatbestendige omgeving[16];

1.12.1 Short-term initiatives

Transport and travel demand and needs assessment*:* Assessing current and projected transport and travel demand within the health care sector should help pinpoint the primary sources of emissions. Identifying these carbon hotspots allows for targeted prioritisation of decarbonisation actions with the highest potential to reduce GHG emissions. This assessment should encompass all relevant transport activities, including travel by health care professionals, patients, visitors, and medical transport services. An evaluation of electric vehicle (EV) charging infrastructure should also support this assessment.

Decarbonisation action market research and feasibility study: With an evidenced and granular understanding of the most GHG emissions intensive components of transport and travel, there is a need to systematically identify and evaluate potential decarbonisation opportunities. Transportation and travel practices across different health care sectors should be considered in the identification of decarbonisation actions

Potential outcomes:

- A health care sector fleet inventory that includes both owned and leased vehicles across health care system entities.
- A comprehensive transport and travel demand assessment covering all facets of health care system mobility.
- GHG emissions hotspot analysis of different transportation and travel practices in the sector.

1.12.2   Medium-term initiatives

Transportation and travel decarbonisation action pilot testing: Pilot programmes to test the practical implementation of the screened decarbonisation measures across different health care entities and regions, allowing for an in-depth analysis of their effectiveness in achieving decarbonisation goals. The goal is to validate the indicative costing, resourcing requirements, and feasibility of implementation for each action, while assessing their impact on health, emissions reduction and operational efficiency within the health care sector. The pilots should also help identify any challenges or opportunities for scaling these actions across the broader health care system.

Potential outcomes:

- A set of piloted actions that have been tested for effectiveness and feasibility, with an evidence base for their scalability across the health care system.
- Refined Implementation Models: Insights into the practical challenges and resourcing needs of implementing actions in different health care entities and regions, leading to tailored implementation strategies.

1.12.3   Long-term initiatives

Rollout of piloted transportation and travel decarbonisation actions: Following the deployment of various pilot programmes, learnings can be elicited to inform the system-wide implementation of decarbonisation actions. The performance of pilot programmes against the evaluation criteria should help to inform how they can be adjusted to maximise efficacy, whilst ensuring that each action is adapted to fit varying regional and organisational needs.

Expansion of the types of transport and travel decarbonisation actions rolled out: Based on insights from the initial action rollouts, it is possible expand the scope of decarbonisation efforts in the health care sector by scaling up actions across a broader range of assets and operations that contribute to emissions. Here it is possible to refine and integrate best practices, extend support to additional health care facilities, and increase the scope of what qualifies as a priority for decarbonisation. By widening the criteria for priority assets, this action ensures a comprehensive, inclusive approach to decarbonisation that reaches both high-impact and previously lower-priority areas.

Potential outcomes:

- Expanded decarbonisation actions encompassing a larger array of health care assets and facilities, driving widespread emissions reduction.
- Adoption of uniform, scalable best practices in decarbonisation across the Belgian health care system, creating a cohesive framework for sustainable transport and travel.
- Increased access to funding and policy frameworks tailored to ensure sustainable and long-term implementation of decarbonised transport solutions.

1.13 Action area 4: Provide healthy, sustainably grown food and support climate resilient agriculture

Goal: Provide nutritious, low-carbon and sustainably sourced food with zero food waste to both staff and visitors.

Typical actions:

- Integrating GHG emissions criteria into procurement processes.

- Encouraging plant-based food options.

- Limiting high-emission food option, such as beef- and dairy-based products.

- Localise the supply chain, implementing seasonal menu rotations based on local crop availability.

- Develop composting programmes for organic waste management.

- Waste management awareness campaigns.

Relevant policies:

- EU: Farm to Fork Strategy[26]

- Federal and regional: Regional food strategies, such as Wallonia's Eat Tomorrow[27], Flander's Agricultural Policy Plan[28], Strategic Plan Bio, and regional food waste reduction guidelines in Wallonia and Brussels., the Flemish climate & Health plan (chapter 4. NetZero Health care)[11], Food loss and biomass (residual) streams circular 2021 - 2025[29]; Flemish protein strategy[30], Flanders Energy and Climate Plan 2021-2030[12], Flemish Climat Strategy 2050[15], Green deal klimaatbestendige omgeving[16]

1.13.1 Short-term initiatives

Food emissions diagnosis: To implement targeted actions to decarbonise food consumption, it is first necessary to developing a clear picture of the food-related emissions sources across the health care system. This necessitates the collection of data on the types and quantities of food products consumed, the sourcing details (e.g., the distance and mode of upstream transportation) and the associated wastage of food for different health care entities. Once the sources of emission are identified and quantified, it should be possible to evaluate the relative performance of different health care facilities in food emissions and to prioritise the sources of emissions to mitigate.

Food decarbonisation action screening: For health care facilities that have been identified as performing poorly in regard to food-related GHG emissions, it is then possible to screen for the most impactful possible decarbonisation actions which target the emissions hotspots. This encompasses a range of possible actions relating to food procurement, inventory management and meal planning, as well as waste management. The screening process should help to prioritise cost-effective, feasible actions that align with the resources and needs of each facility.

Potential outcomes:

- A comprehensive understanding of the GHG emissions associated with food consumption by health care facility type, allowing for targeted actions.

- Development of performance standards for food emissions by entity type, guiding health care facilities towards more sustainable food consumption.

- Identification of practical, facility-specific actions to reduce GHG emissions, aligned with the capabilities and requirements of each health care entity.

- Cost-benefit analyses for identified actions, supporting data-driven decision-making for investments.

1.13.2 Medium-term initiatives

Food decarbonisation action pilot testing: Implementing pilot projects in a controlled, measurable manner should allow for the evaluation of which actions provide the most impactful decarbonisation results with practical resource and cost considerations. These pilot tests should include rigorous monitoring, reporting, and evaluation protocols to generate data the performance of each action, facilitating the scaling of successful solutions

- Detailed insights into the cost, feasibility, and emissions reduction potential of different food actions in a health care setting.
- Establishment of a structured funding and policy framework to support sustainable food pilots, including potential competitive funding processes or capped subsidies.

1.13.3 Long-term initiatives

Rollout of previously piloted food decarbonisation actions: After reviewing the outcomes of the pilot actions, including successes, challenges, and feedback from participating facilities, it is possible to identify the most effective actions to enact across the food system more broadly. At scale, these actions have the potential to achieve sector-wide reductions in food-related emissions.

Expansion of existing and new food decarbonisation actions: As action programmes are rolled out across the health care system and the capacity for further emissions reductions diminishes, further decarbonisation can be achieved by broadening the assets that qualify for decarbonisation efforts and expanding the types of actions deployed.

Potential outcomes:

- A broader adoption of effective decarbonisation actions across health care facilities, contributing to a sector-wide reduction in food-related emissions.
- Availability of funding to support the implementation of scaled actions, ensuring that health care facilities can access necessary resources.
- Development of clear policies and regulations to guide the wider rollout of actions, ensuring that best practices are adopted consistently across all health care entities

1.14   Action area 5: Incentivise and produce low-carbon pharmaceuticals

Goal: Reduce the carbon footprint of pharmaceutical production and usage by promoting sustainable manufacturing practices and minimising unnecessary pharmaceutical use across the health care system.

Typical actions:

- Health care providers:
    - Embedding carbon limits or emissions assessment criteria into tender processes and product authorisation protocols.
    - Re-evaluate the potential for fixed-dose combinations and prolonged-release forms.
- Develop prescribing guidelines to consider the GHG emissions impact of medicines in the selection of medicines prescribed.
- Pharmaceutical companies and relevant regulatory bodies:
    - Financial or technical support for decarbonisation roadmap development.
    - Financial support for decarbonising production processes, such as subsidies, tax incentives, or access to research and development funding.
    - Extending shelf life or revising expiry dates of pharmaceuticals.
    - Adjusting permissible storage temperatures where feasible.
- Revising packaging design standards to minimise waste and maximise circularity.
- Guidance within the product packaging, advising users on optimum disposal methods for products and packaging. This could include using reuse or return methods for packaging.
- Advice to users on actions to take if superfluous products are received through subscription services. This could include storage conditions, take back schemes, or adjusting ongoing product amounts they receive.

Relevant policies:

- EU: EU Pharmaceutical Strategy[6]

1.14.1   Short-term initiatives

Engage with suppliers to gather product level GHG emissions data for key products: The collection of product-level GHG data through Environmental Product Declarations (EPDs) and other disclosures can enable evidence-based decision-making to prioritise low-carbon alternatives. Through the integration of requests for such information from suppliers into procurement processes, progress can be made towards an improved understanding of emissions hot-spots, and a clear message to suppliers is sent that they should need to demonstrate environmental credentials in order to remain competitive in the Belgian market.

Review existing initiatives and standards supporting pharmaceutical sector decarbonisation: Though conducting a review of policy, industry initiatives, and sustainability standards in place for the sector opportunities to align with, and reinforce, existing approaches to reducing the industry's environmental impacts can be identified. Due to the multi-national nature of many pharmaceutical providers, aligning approaches to incentivising and driving action across regions can provide an efficient and consistent mechanism to set clear standards and promote change.

Potential outcomes:

- Access to a product-level GHG data for key pharmaceuticals; promoting the selection of low-carbon pharmaceutical products in tender and purchasing decisions.
- Clear understanding of the international mechanisms and standards for the sector and opportunities for the Belgian health system to support and amplify.

1.14.2 Medium-term initiatives

Integrate product level GHG data into pharmaceutical procurement guidelines: Enable procurement and prescription processes to consider environmental impact of alternative treatments and suppliers. Through enabling informed decision making from health care professionals and administrators, low-carbon alternatives can be prioritised through health care delivery where they pass existing cost and clinical criteria.

Potential outcomes:

- Clear procurement standards and expectations for pharmaceutical suppliers into the Belgian health system to reduce product emissions intensities.

1.14.3 Long-term initiatives

Engage with high-emission suppliers to prioritise decarbonisation of products critical to care delivery: Following the adoption of procurement protocols and data collection exercises across pharmaceutical suppliers, there is likely to be a number of high-intensity suppliers providing key products and treatments. There are a number of reasons why suppliers may struggle to act on emissions and align with ambitious procurement standards, which may include a lack of in-house capacity to identify and act on decarbonisation opportunities, constraints around industrial processes and inputs, and a lack of financing. Through engaging with such suppliers, the sector can better understand these barriers to change, and in some cases can help suppliers to identify the steps and actions they can take to begin to make progress on emissions mitigation.

Potential outcomes:

- Clarity on the barriers to emissions reduction for high-impact, hard to abate, products.
- Identification of opportunities to provide further support to build capacity and instigate mitigation measures.

1.15 Action area 6: Implement circular health care and sustainable health care waste management

Goal: Implement circular economy principles to shift procurement approach, make material strategies more resource efficient, reduce the volume and toxicity of waste, and manage waste more circularly.

Typical actions:

- Sustainable procurement criteria (e.g. recyclability and durability as well ensuring fair competition and equal opportunities for SMEs).

- Product-as-a-Service models.

- Material recovery systems to facilitate return and recycling of medical devices.

- Waste segregation and increased sustainable waste management.

- On-site composting and alternative waste treatments.

- Digital reporting and tracking of health care resources and waste.

Relevant policies:

- EU: Circular Economy Action Plan (CEAP)[5], Directive 2024/24/Eu as adapted.

- National and regional: Federal Waste Management Regulations, Belgium Builds Back Circular Initiative[31], Wallonia Waste-Resource Plan[32], Circular Flanders[33], Brussels' Regional Circular Economy Strategy[34], the Flemish climate & Health plan (chapter 4. NetZero Health care)[11].

1.15.1 Short-term initiatives

Baselining circularity performance: Understanding the status of resource consumption and waste management within the Belgian health care system is an essential step towards implementing circular economy principles. This baseline should provide a clear starting point, aiding the identification of high-impact areas for circularity improvements, set measurable benchmarks, and track progress toward a sustainable, low-waste health care system.

Circularity action screening: Building upon the actions identified within the baselining exercise, this screening process should assess various actions relating to circular business models, material strategies, inventory management systems, waste minimisation, and alternative end of life disposal practices. By systematically evaluating these actions, high-impact, feasible solutions can be identified for health care facilities, driving sector-wide progress toward a sustainable, low-waste health care system.

Potential outcomes:

- A comprehensive circularity baseline of waste generation, resource recovery, and sustainable procurement practices across health care facilities, focusing on both current practices and potential for systemic redesign.

- Identification of priority areas for systemic change through the introduction of circular models (e.g. service-based procurement, EPR, and reverse logistics).

- Establishment of initial benchmarks and indicators to measure progress in circular practices, supporting the adoption of circular economy principles across the health care system.

- Identification of the most impactful and feasible actions to advance circular health care practices, supporting sustainable waste management and resource efficiency.

1.15.2 Medium-term initiatives

Piloting of priority circularity actions: Piloting requires the implementation of high-priority circularity actions at a small-scale to test their effectiveness and feasibility. This builds on the outcomes of the screening phase and allows for the collection of real-world data on operational challenges, resource needs, and environmental impact.

- Evidence-based assessment of priority actions, demonstrating their feasibility, effectiveness, and impact in real health care settings.
- Detailed insights into which actions are suitable for broader implementation and any necessary adjustments or support required for scaling.
- Data-driven recommendations for policy development, funding, and resource allocation to support sustainable circular practices across the health care system.

1.15.3 Long-term initiatives

Rollout of tested circularity actions: Building on the results of the pilot phase, this action should implement successful actions system-wide, targeting initiatives that demonstrated strong performance in emissions reduction, resource recovery, scalability, and cost-effectiveness. This rollout should be supported by policy frameworks, funding mechanisms, and capacity-building initiatives, enabling health care facilities to integrate circularity practices seamlessly and sustainably.

Scaling of circularity action rollout: Builds on the initial phase of circularity action rollout by expanding their implementation to a broader scope of facilities across Belgium, whilst introducing additional actions that align with circular economy and waste management goals. This phase aims to establish widespread adoption of circular practices and diversify the types of actions deployed, moving beyond the initial priority areas tested in pilots. The goal is to embed circular health care and sustainable waste management practices as standard operating procedures within the health care sector.

Potential outcomes:

- Broader implementation of successful circular actions, leading to reduced health care sector waste and emissions.
- Comprehensive integration of circular actions across health care facilities, establishing a sustainable foundation for long-term waste management and resource efficiency.
- Establishment of circularity and waste management as core components of health care operations, aligning with Belgium's decarbonisation and environmental goals.

1.16 Action area 7: Establish greater health system effectiveness, eliminating inefficient and unnecessary practices

Goal: Reduce emissions by enhancing health system effectiveness, removing wasteful and unnecessary practices, integrating carbon reduction with quality of care.

Typical actions:

- Comprehensive medication review programmes
- Deprescription guidelines
- Protocols for appropriate levels of care
- Targeted diagnostic accuracy training and decision-support tools
- Clinical Decision Support Systems to flag inappropriate prescriptions, redundant testing, or contraindications in real time
- Audit and feedback mechanisms for prescription and treatment patterns.
- Integration of climate impacts into clinic quality definitions
- Strengthen health care facility infection prevention measures
- Expansion of preventative health programmes
- Health care workers to be trained in sustainable practices

Relevant policies:

- EU: European Health Union[35]
- National and regional: Federal Quality of Care Law[36]

1.16.1 Short-term initiatives

Health care system effectiveness diagnosis: Assess and evaluate current practices deployed within the Belgian health care system to identify inefficiencies, waste and low-value practices, representing areas where both carbon emissions and health outcomes can be optimised. This diagnosis could involve analysing various components of the health care system—including clinical delivery, facilities and operations, supply chains, and the broader economy. By adopting an approach that integrates carbon reduction with clinical effectiveness, the diagnosis could help uncover areas of overprescribing, overtreatment, and redundant practices that contribute to avoidable emissions and strain the system's resources.

Screening of actions to improve system effectiveness: Once the diagnosis has been completed, potential actions must be evaluated. The goal is to identify a suite of actions that can be implemented to deliver improvements in both clinical outcomes and carbon performance.

Potential outcomes:

- Identification of inefficiencies and waste across care pathways, facilities, and operations that contribute to unnecessary carbon emissions and increased costs.
- Improvement of quality and effectiveness of health care provision.
- Diagnostic report providing actionable recommendations to improve system effectiveness while reducing emissions.
- Identification and prioritisation of actions aimed at reducing health care inefficiencies, improving the quality and accessibility of health care and reducing emissions.
- Assessment of policy changes, procurement practices, and clinical guidelines that align carbon reduction and health system effectiveness.

1.16.2 Medium-term initiatives

Piloting of actions to improve system effectiveness: Following the identification of actions to improve synergies between health care efficiency and decarbonisation, these actions should be piloted to determine suitability. The goal is to demonstrate the efficacy of integrated, low-carbon, high-quality care practices and develop a roadmap for full-scale deployment across Belgium's health care system.

- Assessed pilot actions in real-world settings to measure their effectiveness in improving health care quality, reducing inefficiencies, and lowering carbon emissions.
- Identification of barriers and enablers to the successful implementation of the actions, including challenges in clinical workflows, patient care, and resource allocation.
- Understanding of the feasibility of scaling successful actions, including recommendations for policy adjustments, funding, and resource allocation for nationwide deployment.

1.16.3   Long-term initiatives

Rollout of tested health system effectiveness actions: Once the priority actions have been refined and shown to not impact health care quality while delivering carbon reductions, the next step is to ensure their systematic implementation across the entire Belgian health care system. This process involves scaling the actions, adjusting policies, and providing support to health care providers to facilitate smooth transitions and continued effectiveness. The goal is to embed these actions into standard health care practices and organisational structures to achieve long-term sustainability, improve operational efficiencies, and reduce the carbon footprint of the health care system on a national scale.

Scaling of health system effectiveness action rollout: Extend the successful actions that were initially tested and piloted. This initiative focuses on expanding the scope of the actions beyond the pilot phase to encompass a larger, more diverse range of health care facilities, practices, and regions across Belgium. By scaling up, the goal is to embed these low-carbon, efficient, and sustainable practices within the broader health care system, further ensuring that carbon reduction is realised at a national level.

Potential outcomes:

- Nationwide adoption of effective, tested actions, resulting in improved health care delivery, efficiency, and reduced carbon emissions.
- Streamlined integration of sustainability and system effectiveness into regular health care processes, leading to better use of resources and more resilient health services.
- Strengthened policy frameworks and incentives to ensure the continued success and scaling of low-carbon actions in the health care sector.
- A broader implementation of successful low-carbon and efficiency-driven actions across the Belgian health care system, resulting in significant carbon reductions and improvements in care quality.
- Long-term integration of sustainable and efficient health care practices within everyday operations, leading to increased resilience and reduced environmental impact across the entire health care sector.

Monitoring and evaluation

Monitoring and evaluation of the action plan is important to understand the impact delivered by the actions towards reducing GHG emissions in the Belgian health sector. Two types of monitoring should be undertaken:

1. **Monitoring of the implementation process,** which would focus on how the actions are implemented against the timeframe, budget and components of each of the actions. The aim of the implementation monitoring is to ensure that the actions are delivered in keeping with the original aim of each action, that the right data is collected to ensure further monitoring and that lessons learnt are shared between actions.

2. **Monitoring of the results**, evaluating whether the implemented actions are bringing the expected benefits in GHG emissions terms. This should be done through the analysis of quantitative and qualitative data collected during and post implementation of the actions and compared with the baseline analysis.

When designing a monitoring and evaluation approach, it is key to consider the balance of resource required to conduct this process and resource availability across the wider programme including implementation of decarbonisation approaches.

1.17   Components of implementation process monitoring

The monitoring of the implementation process could contain several components:

Responsibilities

The Coordination Unit should develop an implementation plan overseeing the implementation and coordination of the actions. The implementation plan should build upon this action plan to define actions, action owners, implementation partners, capex and opex estimates, and financing mechanisms. The Coordination Unit should oversee the integration of actions with wider policy interventions within the Belgian federal and regional administrations. Each action owner in federal and regional administrations should be responsible for the implementation of actions and monitoring of output indicators such as those presented in Table 2, which should be fed back to the Coordination Unit. Action implementation and coordination with external stakeholders should sit with the relevant administrative departments.

Financial planning

In order to achieve the scale and pace of financing that will be required to implement the roadmap, an investment plan for the sector should be developed as part of the implementation plan by the Coordination Unit. This investment plan will identify relevant existing and new sources of public and private financing mechanisms for each of the costed actions, such as national and regional funds, thematic bonds, corporate/off balance sheet, blended finance and other sources. Each action owner should be responsible for creating a budget for each action and plan to leverage the financing mechanisms identified in the investment plan, and should be responsible for securing financing for the actions. These should be reported periodically to the Coordination Unit to ensure uniform reporting between different actions.

Monitoring and reporting framework

For each action, the unit should create a monitoring and reporting framework. The framework should detail the action owner's responsibilities, timelines for implementation processes, and methods and arrangements for stakeholder engagement with health care facilities for tracking of progress. The framework could build on the sequence of steps provided to implement each action in Appendix A.1. It should include a schedule of indicators to be collected and agreement over periodic reporting of output indicators from health care facilities. Monitoring and reporting of the implementation process should be undertaken in tandem with the monitoring and reporting of emissions reductions.

1.18   Components of results monitoring

Monitoring the results of the actions is an important part of understanding the impacts and outcomes delivered by the actions. The on-going monitoring of these results would allow the Coordination Unit to track emissions reductions over time and to adjust actions and financing mechanisms to ensure that the expected outcomes are met in a timely manner. Data on the emissions reductions of actions can be used to iteratively update the national health system emissions inventory. Sequential reporting could enable the evaluation of progress in decarbonisation and the efficacy of current actions, highlighting the scale of change needed to achieve decarbonisation goals and the priority sources of emissions to reduce.

Responsibilities

The Coordination Unit should oversee the development of a sustainability data governance framework for the health sector. This framework should be broader than emissions to enable a holistic approach to sustainability of the health sector.[iv] The Coordination Unit should ensure that the necessary infrastructure and guidance are in place to facilitate accurate and timely data collection. Data collection responsibilities should rest with the action owners during the implementation phase, with health care facilities holding responsibility for providing the required data. Upon completion of actions, arrangements should be established to ensure health care facilities report on emissions reductions in line with their reporting responsibilities.

Data governance framework

The sustainability data governance framework for the health sector should be based on open standards to ensure transparency, accessibility, and data integration across reporting entities. Open standards and interoperability would foster public accountability and transparency, whilst allowing the Coordination Unit to efficiently pool and analyse bottom-up data from all health care facilities.

Good data governance approaches fall under three categories:[v]

- Structural data governance practices, including principles and norms around data practices, ensuring accountability through ethics and data governance committees, creating new organisations to steward data and encouraging participation by all stakeholders including health care practitioners, patients and the wider community.

- Legal data governance practices, including IP and data governance frameworks, creating data sharing contracts, adopting standard open data licences, and requiring certification and assurance processes.

- Technical data governance practices, including adopting open standards and interoperability, sharing good practices around providing metadata, provenance and attribution support appropriate reuse, creating data hubs, portals, and visualisation/dissemination tools and implementing data security and privacy enhancing technologies to make it easier to process and use data without revealing sensitive information.

Based on the openness of the dataset, access permissions can be determined so that data at lower risk can be more easily facilitated to be shared, while sensitive data can be protected through stricter data sharing arrangements. Technology can also be used as an enabler to manage data sharing. A security model known as 'zero trust', for example, builds in access and permission controls in a way that assumes data users should not have access.

Public disclosure

Regular reports should be published every 1-2 years, detailing progress on each action, financial expenditures, and emissions reductions against established indicators. These reports should be made publicly accessible through an online portal, adhering to open data principles. Public disclosure should also include updates on challenges encountered and corrective measures undertaken, fostering trust and enabling informed dialogue with stakeholders, including health care providers, civil society, and the general public.

[iv] A complementary study on the sustainability of the health sector is currently being undertaken by the Belgian Health Care Knowledge Centre
[v] For guidance and case studies refer to the Open Data Institute

1.19   Ongoing progress tracking

The monitoring and reporting frameworks should be developed to consider progress in a number of areas, with performance tracked using predetermined metrics. Targets can be added to these metrics over time to help evaluate the performance.

To effectively track progress and impacts of the Action areas, key metrics have been identified to assess emissions, energy use, and supplier engagement. These are shown here and act as headline measures of overall performance.

A monitoring and reporting framework should be developed that considers progress in a number of areas, with performance tracked:

- Total emissions for the health sector (tonnes CO_2e/ year) and facilities over a certain size.

- Emissions intensity for the health sector (tonnes CO_2e/ EUR/ year).

- Energy use intensity for facilities (kWh/m^2).

- Average emissions intensity of purchased electricity (tonnes CO_2e/kWh).

- Proportion of suppliers with Science-Based Targets (SBTi) (%).

A detailed table of output and impact indicators for each Action area is included in Section A.2. This should inform the more detailed results monitoring and reporting framework described above.

1.20   Improving the emissions baseline

There are a range of improvements surrounding data availability and collection that could enhance the precision, detail, and reliability of the emissions baseline. The recommendations captured below reflect improvements that should be prioritised in future reporting. Many of these align with the recommendations captured elsewhere in this report around open data collection and monitoring.

Gather detailed data for all health care provider typologies

When developing this analysis, there was an inconsistency in the detail of available data covering the operations of health care provider typologies. High quality expenditure data covering procurement in Belgian hospitals was provided, but for many other types of facility such information was lacking which required the use of proxy spending profiles to model emissions associated with the health care supply chain.

The potential of open data for deriving emissions footprints can enhance transparency, consistency, and accessibility of emissions data calculations. However, to ensure the quality and comparability of emissions profiles, it is essential to establish data standards and implement robust data governance practices. Establishing data standards and implementing more robust data governance practices could help to both streamline the data collection process and improve the availability of quality bottom-up data.

Regionally disaggregated expenditure data

The emissions baseline produced through this study is reliant national-level expenditure data, identifying a more detailed breakdown of health care provider expenditure by region would produce a baseline that captures more variation between regional activity and spending. A shift towards more granular, regional expenditure data would provide greater transparency and understanding of the emissions calculation process, split between regions. Many of the carbon mitigation opportunities identified through this programme may be best implemented through regional strategies and programmes, and reporting that aligns with these regional approaches would support this.

Reliable counts of facilities within each region and health care provider

Identifying reliable facility counts within each region and health care provider will enable greater extrapolation of bottom-up data from one region to another, from a singular or subset of facilities within a health care provider to the entire health care provider, and (where reasonable) from one health care provider to another. Reliable facility counts will further enable stronger data quality checks and facilitate (where reasonable) scaling of incomplete data sets. This data will support implementation of actions focussed on building performance.

Pharmaceuticals emissions factor

The emissions factor applied to pharmaceutical expenditure has a significant impact on the magnitude of the total sector footprint. Further research to identify a more precise expenditure-based emissions factor reflecting pharmaceutical procurement within Belgium could enhance the precision of the baseline considerably.

Anaesthetic usage

Anaesthetics are a scope 1 emissions source specific to the health sector that have a high global warming potential and have a significant impact on the environment. For instance, anaesthetic and analgesic practices are estimated to comprise 2% of the UK's National Health System's emissions footprint. Identifying a reliable sector-wide figure capturing anaesthetic usage (disaggregated from other non-emissive pharmaceuticals) would help fill a significant data gap in the footprint.

Other scope 1 emissions sources also represented data gaps in this baseline assessment. These include emissions associated with refrigerant leakage from facilities and on-site waste treatment (e.g. incinerators in hospitals). Identifying data that reflects these sources could further improve the quality and coverage of the baseline's scope 1 emissions included in the footprint.

Patient travel

Though most patient travel (to and from health care facilities) sits outside of the health system's expenditure, its associated emissions are considerable given magnitude of services and appointments provided annually to accommodate the health needs of an entire population. The health care system and organisations can influence emissions associated with patient travel by providing more remote/tele-health services, providing services closer to patients' homes, and incentivising the use of less emissive transport modes (e.g. cycling, public transport etc.) Accordingly, collecting data to quantify emissions associated with patient travel can contextualise the potential emissions reductions that could be achieved by exerting influence over this emissions source.

(Note: some patient travel data was captured in the Hospitals expenditure profile. This, however, is only expected to account for subsidised patient travel services – a small proportion of total patient travel emissions.)

Major construction activities

One significant data gap in the baseline surrounded the inclusion of data in expenditure profiles reflecting major construction and other capital projects. As the construction of new facilities are often accounted for separately from operating expenditures, identifying expenditure sources inclusive of both spending types can be a challenge. As the construction of new facilities may be the most significant and emissive data gap within capital goods, identifying expenditure data covering the major projects or the construction of new buildings at both the health care provider level and a regional- or national- level could help account for a considerable data gap.

A.1 Initiative steps and stakeholder assignment

A.1.1 Action area 1: Power health care with 100% clean, renewable electricity

A.1.1.1 Steps to take to enact short-term initiatives

Initiatives	Steps	Step description	Key stakeholders
Building stock renewable electricity diagnosis, typology and benchmark setting	Undertake standardised data collection and create building typologies.	Establish protocols to gather consistent data on electricity sources, demand patterns, peak loads, and renewable electricity mix for health care facilities. Categorise facilities by standard building typologies while incorporating an assessment of energy flexibility potential (e.g., ability to shift or reduce peak loads). Standardized data collection enables effective comparisons and supports benchmarking.	Stakeholders/ Ministries of climate; Ministries of energy; Ministries of health; Ministries of infrastructure/ public works; Government and regulatory agencies
	Develop typology-based performance benchmarks for renewable electricity	Create benchmarks for renewable electricity performance and demand-side flexibility by building type, defining thresholds for good and poor performance to guide facility improvements.	
Renewable electricity action screening for both new and existing assets	Create screening assessment criteria	Define clear criteria for evaluating renewable energy options, such as resource availability, technical maturity, cost, scalability, and environmental impacts. Integrate criteria for demand-side flexibility measures like load shifting and intelligent storage solutions. Implement criteria to evaluate the costs of potential actions for health care facilities of varying sizes and financial capabilities. Consider available financial mechanisms or subsidies to offset upfront costs of renewable installations, such as low-interest loans, grants, and tax incentives.	Stakeholders/ Ministries of climate; Ministries of energy; Ministries of health; Ministries of infrastructure/ public works; Industry experts in renewable energy
	Conduct screening of possible renewable electricity actions	Conduct or contract out an assessment of possible actions to boost renewable electricity consumption as a share of total electricity and to enhance energy flexibility. Consider onsite renewable options (e.g., solar PV, wind, battery storage) and offsite solutions (e.g., PPAs, RECs). Evaluate demand-side measures like demand response programs and advanced energy management systems. Engage industry experts to ensure comprehensive evaluation.	

Initiatives	Steps	Implementation and policy considerations	Key stakeholders
Pilot testing of renewable electricity actions	Develop clear eligibility and selection criteria for actions used in pilots	Define criteria to select facilities and actions eligible for pilot testing, prioritizing those with potential for significant renewable electricity increases and demand-side flexibility enhancements. Include a range of action types to test across diverse health care settings.	Stakeholders/ Ministries of climate; Ministries of health; Ministries of energy; Ministries of innovation
	Create an evaluation framework for pilot programs	To evaluate the efficacy of the pilot projects, create a framework with standardised KPIs for renewable electricity share increase, resilience, cost-effectiveness, and operational impact. Include both quantitative and qualitative metrics (e.g., staff and patient feedback). Benchmark results across facilities to identify the most effective actions. To further aid the assessment of scalability, test pilots for adaptability across different health care facilities (e.g., clinics, hospitals, etc.).	Stakeholders/ Ministries of health; Ministries of climate; Stakeholders/ Ministries of energy; Ministries of innovation
	Deploy funding and incentive mechanisms	Allocate a dedicated public funding pot for pilot projects, potentially accessible through a competitive bidding process or an application-based funding model. Explore options for subsidy mechanisms such as capped subsidies for specific actions or matched funding for facilities investing in renewable technologies. Provide additional financial support for health care facilities that may lack upfront capital, especially smaller or rural facilities.	Stakeholders/ Ministries of health; Stakeholders/ Ministries of climate and of finance or budget; Ministries of energy; Ministries of innovation
	Provide supplementary capacity building and training	Provide training and technical assistance for facility staff on pilot project implementation and monitoring processes to maximise the efficacy of delivery and the reliability of learnings.	Stakeholders/ Ministries of health; ministries of energy or/and climate , Ministries of education and training; Ministries of innovation

Initiatives	Steps	Implementation and policy considerations	Key stakeholders
Rollout of previously piloted renewable electricity actions	Create a strategy for scaling tested actions	Reflect on the success of pilot projects against evaluation framework to select and refine programmes for broad rollout. The choice of projects to deploy more broadly should consider the successes, challenges, and outcomes of the pilot projects, considering technical performance, cost-effectiveness, and overall impact on RE share and resilience. Develop a detailed scaling strategy that accounts for the diverse needs of health care facilities (e.g., size, typology, geographical location). Develop scaling strategies that prioritize facilities with the lowest renewable electricity share and limited flexibility, whilst ensuring equitable access to solutions.	Government and regulatory agencies; Stakeholders/ Ministries of health; Ministries of energy and/or climate

Initiatives	Steps	Implementation and policy considerations	Key stakeholders
	Secure financial mechanisms for rollout	Secure funding to support the expansion of successful pilot programs. This may include government funding, private investments, or public-private partnerships. Explore opportunities for cost-sharing mechanisms, grants, or subsidies to reduce the financial burden on health care facilities, particularly smaller ones or those with limited budgets.	Stakeholders/ Ministries of climate; Ministries of energy; Ministries of finance /budget; ministries of health, Financial institutions
	Deploy an associated training and capacity building programme	Develop training programs for health care facility staff to ensure they are equipped with the necessary knowledge and skills to manage and maintain the renewable electricity and flexibility actions. Work with energy providers, consultants, and technology developers to facilitate knowledge transfer and capacity building within the health care sector.	Stakeholders/ Ministries of health; Ministries of energy and/or climate, education and training; Energy providers; Industry experts in renewable electricity
	Streamline the implementation process over time	Reflect on learnings from earlier deployments to simplify the scaling processes. This may include creating clear guidelines for implementation, standardising contracts for Power Purchase Agreements (PPAs), or pre-selecting renewable energy vendors for ease of procurement. Ensure that a step-by-step implementation guide is available for health care facilities, helping them to integrate renewable energy and manage peak loads effectively.	Stakeholders/ Ministries of health; Ministries of education and training; Industry experts in renewable energy; Ministries of climate; Ministries of energy;
Scaling of renewable electricity action rollout to include more types of actions	Increase the scaling of existing and new actions	Expand the deployment of existing actions to for facilities in order of priority. Continue to bring new actions through the piloting and scaling pipeline, again in cascading order of priority judged during the screening phase.	Stakeholders/ Ministries of health; Industry experts in renewable energy; Ministries of climate; Ministries of energy;
	Scale resources mobilised	Allocate sufficient financial resources to support the scaling process, considering the funding required for both large-scale actions and the specific needs of smaller or resource-constrained facilities. Explore opportunities for co-funding or public-private partnerships to help spread the financial risk and provide greater access to capital for the rollout.	Ministries of finance/budget; Financial institutions; Ministries of climate; Ministries of energy;

A.1.2   Action area 2: Invest in zero emissions buildings and infrastructure

A.1.2.1   Steps to take to enact short-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Building and infrastructure stock GHG emissions diagnosis, typology and benchmark setting	Undertake standardised buildings and infrastructure GHG emissions data collection and create typologies.	Conduct a comprehensive stock-taking exercise to classify the range of buildings and infrastructure assets within the Belgian health care system into standardised typologies. Once categorised, collect asset data on structural attributes and associated embodied carbon, alongside energy systems and associated consumption profiles. Identify opportunities to align or integrate the building and infrastructure stock diagnosis with existing energy audits or compliance requirements to maximise efficiency and minimise duplication of efforts.	Stakeholders/ Ministries of climate/ environment; Ministries of health; Ministries of climate; Ministries of energy; Ministries of infrastructure or public works; Building performance experts
	Develop typology-based performance benchmarks for GHG emissions and energy efficiency	In collaboration with building performance experts, use the asset GHG emissions and energy efficiency performance data to create realistic and actionable benchmarks specific to the asset typologies. Ensure these benchmarks accommodate the unique operational needs and sustainability challenges of health care buildings.	
Decarbonisation action screening in buildings and infrastructure retrofit and new build	Create screening assessment criteria	Define clear criteria for evaluating decarbonisation actions, such as potential to reduce emissions, cost-effectiveness, feasibility (including regulatory compatibility), impact on health care operations and scalability. Screening criteria should also prioritise solutions based on emissions hotspots, ensuring that the highest-impact actions for each asset typology are identified and targeted first. Consider available financial mechanisms or subsidies to offset upfront costs of renewable installations, such as low-interest loans, grants, and tax incentives.	Stakeholders/ Ministry of health; Ministry of climate; Ministries of energy; Ministry of infrastructure or public works; Industry experts in decarbonisation actions
	Conduct screening of possible decarbonisation and energy efficiency actions	Perform a systematic screening of potential decarbonisation actions for existing and new buildings and infrastructure within the Belgian health care system. Leveraging data from the building stock diagnosis and focusing on underperforming assets. Screen actions not only on their emissions reduction potential but also for indicative costs, resource needs, and feasibility. This approach allows for prioritising solutions that are both impactful and achievable, ensuring optimal use of funds and resources.	

Initiatives	Step	Step Description	Key stakeholders
Pilot testing of decarbonisation and energy efficiency actions	Develop clear eligibility and selection criteria for actions used in pilots	To ensure that pilot actions are strategically targeted and lead to meaningful insights, establish clear and transparent eligibility and selection criteria for health care assets and decarbonisation actions involved in pilot schemes.	Stakeholders/ Ministries of health; Ministries of climate; Ministries of energy; Decarbonisation and energy efficiency experts and consultants
	Create an evaluation framework for pilot programmes	Create a framework with standardised KPIs for emissions reduction, energy savings, cost-effectiveness, and operational impact. Include both quantitative (e.g., GHG reductions, cost per ton CO_2 avoided) and qualitative metrics (e.g., staff and patient feedback). Benchmark results across facilities to identify the most effective actions. To further aid the assessment of scalability, pilots should be tested for adaptability across different health care assets.	
	Deploy funding and incentive mechanisms	Establish a dedicated funding pool to support pilot projects. Options could include competitive grants, where facilities apply based on emissions potential and action type, or a fixed subsidy model with a cap on the number of pilots funded. This funding could be structured to maximise participation and gather data from a variety of typologies.	Ministries of health; Ministries of climate; Ministries of energy; Ministries of finance and budget of finance; Financial institutions
	Provide supplementary capacity building and training	Provide training and technical assistance to facility staff on pilot project implementation and monitoring processes	Stakeholders/ Ministries of health; Ministries of climate; Ministries of energy; Ministry of education and training; Facility staff
	Evaluate policy action options for scaling	Assess the potential effectiveness of various policy mechanisms based on pilot results. For instance, if a flat subsidy cap is applied to each pilot, determine whether this could effectively be scaled across a larger number of facilities or if a competitive funding pool would better target high-impact sites.	Stakeholders/ Ministries of health; Ministries of climate; Ministries of energy; Industry experts and consultants

Initiatives	Step	Step Description	Key stakeholders
Rollout of previously piloted decarbonisation actions	Create a strategy for scaling the tested actions	By reflecting on the outcomes of pilot projects, select actions with proven impact to rollout across more health care assets, adapting implementation strategies based on pilot findings and feedback. Consider the technical performance, cost-effectiveness, and overall impact on reducing operational and embodied carbon emissions in the choice of actions. Develop a detailed scaling strategy that accounts for the diverse needs of health care facilities (e.g., size, typology, geographical location). Ensure that the strategy prioritise facilities with the highest emissions and energy inefficiencies while ensuring equitable access to decarbonisation solutions.	Stakeholders/ Ministries of health; Ministries of climate; Ministries of energy; Decarbonisation experts and consultants
	Secure financial mechanisms for rollout	Leverage financing measures to that ensure the widespread adoption of actions, including grants, subsidies, or low-interest loans for health care facilities to fund their participation in the rollout. Consider performance-based financing or shared savings models to incentivise investment in energy-efficient solutions.	Ministries of health; Ministries of finance/budget; Financial institutions; Ministries of climate; Ministries of energy
	Deploy an associated training and capacity building programme	Provide training and resources to facility managers, contractors, and other relevant stakeholders to ensure that they have the necessary skills and knowledge to implement and maintain decarbonisation solutions effectively.	Stakeholders/ Ministries of health and environment; Ministries of climate; Ministries of energy; Ministry of education and training; Facility staff; Contractors
	Streamline the implementation process over time	Develop a clear, consistent, and efficient process for scaling actions across a broad range of assets. This process should standardise action procedures, define milestones, and simplify approval mechanisms to accelerate deployment across the health care system without compromising quality.	Stakeholders/ Ministries of health and environment and/or climate; Ministries of energy; Industry experts and consultants
Expansion of the types of renewable electricity actions rolled out	Increase the scaling of existing and new actions	Expand the implementation of current actions across facilities in sequence of poorest to best performance. Ensure actions are customised according to the building and infrastructure typology, function, and the specific emissions profiles of different health care asset types. Continue to deploy new actions through piloting and scaling phases, following the priority order established during the initial screening.	Stakeholders/ Ministries of climate/ environment; Ministries of health; Ministries of energy; Ministries of infrastructure or public works; Building experts
	Scale resources mobilised	Develop a funding and financing strategy that can accommodate the larger scale of action, incorporating potential funding sources such as public funds, EU grants, or private partnerships.	Ministry of health; Ministry of finance; Financial institutions; Ministries of climate; Ministries of energy

A.1.3 Action area 3: Transition to zero emissions, sustainable travel, and transport

A.1.3.1 Steps to take to enact short-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Transport and travel demand assessment	Create a data collection framework and develop an inventory of data on health care sector transportation, travel, and supporting infrastructure	Develop clear guidelines and methodologies for data collection to inform the GHG emissions and needs assessment. Include data on the fleet vehicle types (mode and fuel type) and quantity within the sector; transport and travel demand by mode; and transport and travel purpose (including medical transport and emergency vehicles, professional travel and homework transport, and user and visitor transport), load capacity, and health care facility EV charging infrastructure. Ensure consistency in how transport and travel data is gathered across health care system entities. For fleet vehicles and charging infrastructure owned within the health care sector, consider introducing a formal inventory and tracking system for health care fleets, including leased and owned vehicles. For vehicles used for transportation not owned or leased by health care entities, consider deploying surveys as an approach to data collection.	Stakeholders/ Ministries of health; Ministries of climate; Ministries of energy; Ministries of transport/mobility; Health care providers and facilities; Fleet managers; Health care transport coordinators; Data analysts and consultants; EVs charging infrastructure vendors
	Evaluate the transport and travel emissions within the sector	Conduct or contract out a quantification of GHG emissions based upon the data collection exercise. Ensure quantifications are split by health care entity, transport and travel purpose, as well as vehicle type.	
Transport and travel decarbonisation action market research and feasibility study	Create screening assessment criteria	Define clear criteria for evaluating transport and travel decarbonisation options, such as resource availability, technical maturity, cost, scalability, and policy and regulatory inhibitors. Implement criteria to evaluate the financial costs and savings of actions (e.g., EVs, biofuels, shared transport models, etc.) factoring in incentives, long-term operational savings, and emissions impact. Assess the existing regulatory framework for vehicle emissions to evaluate the need for new policies to encourage adoption of EVs, biofuels, and other sustainable transportation measures.	Stakeholders/ Ministries of health and environment; Ministries of climate; Ministries of energy; Ministries of transport/mobility; Local authorities and municipalities; Data analysts and consultants
	Screen for decarbonisation actions	Conduct or contract out an assessment of possible actions to reduce transport and travel relating GHG emissions. This includes an analysis of the current fleet, infrastructure gaps, and future needs, broken down by the specific health care sector entities (e.g., hospitals, medical centres, home care services) and transport types. Consider actions applicable to the following transport and travel purposes, such as the following examples:	Stakeholders/ Ministries of health environment and/or climate; Ministries of energy; Ministries of transport/mobility; Decarbonisation experts and consultants

Initiatives	Step	Step Description	Key stakeholders
		Medical transport and emergency vehicles: Transitions to EVs and biofuels, including the infrastructure needs (e.g., charging stations, maintenance, etc.). Professional travel and homework travel: Carpooling incentives, EV and biofuel vehicle use, active and public transport use and incentives, remote working incentives, business travel limits, regional travel preferences, and internal carbon pricing policy for business travel. User and visitor travel: Mobility information points to encourage public and active transportation, or campaigns to promoting the health-environment co-benefits of sustainable travel.	

A.1.3.2 Steps to take to enact medium-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Transportation and travel decarbonisation action pilot testing	Define pilot selection criteria, select and design pilots.	Define clear criteria for selecting which decarbonisation actions to pilot (e.g., potential for emissions reductions, cost-effectiveness, scalability), before evaluating and selected the highest priority actions to pilot. Design tailored pilot programs for each transport category (medical transport, professional travel, homecare, and user/visitor transport) considering the specific challenges of each sector (e.g., emergency response times for medical transport, or geographical barriers in rural areas for homecare services).	Stakeholders/ Ministries of health; Ministries of climate; Ministries of energy; Ministries of transport/mobility; Health care providers and facilities; Health care transportation stakeholders; Data analysts and consultants; EVs charging infrastructure vendors
	Engage with health care providers and transportation sector stakeholders	Engage health care entities early in the pilot planning process to ensure alignment with operational needs and to garner buy-in for the pilots. Coordinate with regional authorities to ensure that pilots address local transport infrastructure and regulatory conditions. Consult with transport companies and other private sector partners to ensure that the technical requirements of actions (e.g., electric vehicle charging infrastructure) are met.	
	Prepare pilot data collection measures and evaluation criteria	Prepare data collect systems that enable the assessment of emissions reductions, costs, user satisfaction, and operational efficiency. Develop standardised evaluation criteria for each pilot to allow for cross-comparison.	
	Deploy funding and incentive mechanisms	Identify and allocate funding for pilot programs, including specific budgetary resources for small-scale actions and infrastructure improvements. Explore funding models, such as competition-based public funding pots (e.g., open calls for innovative pilot projects), or flat subsidies with a cap on the number of funded schemes	Ministries of health; Ministries of finance/budget; Financial institutions; Ministries of climate; Ministries of energy

Initiatives	Step	Step Description	Key stakeholders
	Provide supplementary capacity building and training	Provide training and technical assistance to facility staff on pilot project implementation and monitoring processes	Stakeholders/ Ministries of health/environment; Ministries of transport/mobility; Ministry of education and training; Facility staff; Ministries of climate; Ministries of energy

A.1.3.3 Steps to take to enact long-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Rollout of previously piloted transport and travel decarbonisation actions	Evaluate pilots and create a scaling strategy	Assess the pilot schemes against the evaluation criteria to determine which actions could be most effective in large-scale rollout. Produce a scaling strategy for these selected actions, making adjustment to the implementation plans for the actions based on pilot feedback. Ensure that the scaling strategy prioritises action in the areas of transportation or travel which have the potential for the greatest emissions reduction.	Stakeholders/ Ministries of health; Ministries of climate; Ministries of energy; Ministries of transport/mobility; Health care providers and facilities; Health care transportation stakeholder
	Provide an appropriate allocation of funding and incentives	Allocate or reallocate funds for broader implementation, with considerations for both upfront investment and long-term maintenance costs. Introduce financial incentives, grants, or subsidies to encourage health care entities to adopt new transportation solutions like EVs and shared transport services.	Ministries of health; Ministries of finance/budget; Ministries of transport/Mobility; Financial institutions; Ministries of climate; Ministries of energy
	Implement policies to support long-term success	Implement policies to standardise decarbonised transport measures across health care entities, such as emission standards, fleet requirements, or route optimisation mandates. Consider policies that prioritise green procurement for health care transport, encouraging the purchase of eco-friendly vehicles and sustainable infrastructure. Promote policies that support shared transportation, like subsidised carpooling and shared transport	Governments and regulatory authorities; Local authorities and municipalities; Ministries of transport/mobility; Ministries of finance/budget; Ministries of climate; Ministries of energy
	Deploy an associated training and capacity building programme	Invest in training for health care system administrators and staff on the new sustainable travel protocols and best practices for using low-emission vehicles. Encourage knowledge sharing between entities that participated in the pilot and those new to the rollout, creating a community of practice for ongoing support and troubleshooting.	Ministries of education and training; Ministries of health/environment and/or climate; Ministries of energy; Health care system administrators and staff

Initiatives	Step	Step Description	Key stakeholders
Expansion of the types of transport and travel decarbonisation actions rolled out	Re-evaluate the scaling programme to expand to more assets and actions	Define a broader set of criteria to determine new priority assets and facilities to expand the actions to, including those with moderate emissions but high potential for impact through decarbonisation. Conduct a comprehensive review of the successes and challenges observed in the initial rollout to identify effective practices, challenges, and areas for improvement.	Ministries of climate; Ministries of energy; Industry experts and consultants
	Scale funding mechanisms and financial incentives	Designate additional funding and expand access to grants, subsidies, and financial incentives for the broader scope of facilities now prioritised for decarbonisation. Evaluate the feasibility of implementing revolving funds or financial support programs to assist health care facilities in making long-term investments in sustainable transport.	Ministries of health, environment and climate; Ministries of energy; Ministries of finance/budget; Financial institutions

A.1.4 Action area 4: Provide healthy, sustainably grown food and support climate resilient agriculture

A.1.4.1 Steps to take to enact short-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Food emissions diagnosis	Undertake standardised data collection for a food emissions assessment	Undertake a detailed categorisation of health care facilities to classify facilities according to typology (e.g., hospitals, clinics, long-term care facilities, etc.) and to identify the types of food services and consumption patterns. Conduct a detailed inventory of food types, quantities, sourcing details (e.g., local or imported), and waste generation for different health care entities. Design and standardise data collection methods to ensure uniformity across facilities. This may involve digital tracking tools, standardised reporting forms, or partnerships with food suppliers to track carbon footprints. Subsequently conduct or contract out the assessment of food-related emissions.	Ministries of health; Ministries of climate; Ministries of energy; Ministries of food and agriculture; Health care facility managers; Health care nutritionists/ meal planners; Food service providers and caters; Data and environmental experts and consultants
	Develop emission facility-based benchmarks and performance metrics	Define emission benchmarks for different health care entity types (e.g., hospital vs. long-term care facility), considering factors like facility size, patient volume, and meal frequency. Create metrics for evaluating food emissions performance, such as emissions per meal or per patient, to enable comparison across facilities and track progress over time.	
Food decarbonisation action screening	Establish screening criteria and prioritisation framework for decarbonisation actions	Develop clear criteria for selecting underperforming assets based on emissions profiles, facility size, food types, and procurement practices. Use these criteria to prioritise actions for facilities with the highest emissions or the greatest opportunity for improvement.	Ministries of health; Ministries of climate; Ministries of energy; Ministries of agriculture; Data analysts and consultants
	Review of costing and feasibility of actions	Perform a cost-benefit analysis for each identified action to assess financial feasibility, taking into account factors like implementation cost, potential savings, and ease of adoption by different facility types.	

A.1.4.2 Steps to take to enact medium-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Food decarbonisation action pilot testing	Develop pilot selection criteria, select and design pilots	Develop clear criteria for selecting actions to pilot, focusing on their emissions reduction potential, feasibility, and relevance to different health care settings (e.g., hospitals, clinics, etc.). Select and deploy mix of actions to provide insights into various approaches, such as local sourcing, plant-based menu options, and waste reduction measures.	Ministries of health; Ministries of climate; Ministries of energy; Ministries of food and agriculture; Data analysts and consultants

Initiatives	Step	Step Description	Key stakeholders
	Create an evaluation framework for the pilot programmes	Establish clear performance metrics that assess the environmental, economic, and social impacts of the pilot actions. Metrics could include quantitative metrics on carbon footprint reduction and qualitative metrics (e.g., staff and patient feedback).	
	Secure funding and financial support	Explore various funding models, such as a public funding pool where facilities compete for grants based on the quality of their proposals, or a capped subsidy for a set number of pilot projects. Ensure that financial support covers setup costs, monitoring, and reporting, as well as operational expenses incurred during the pilot phase.	Ministries of health; Ministries of climate; Ministries of energy; Ministries of finance/budget; Financial institutions
	Evaluate policy instruments to support pilot success	Evaluate policy options that can support pilot implementation, such as tax incentives for sourcing local, low-emission food products, or reduced VAT for participating facilities. Consider policies to streamline procurement processes, allowing health care facilities to more easily access local and sustainable food suppliers during the pilot phase.	Governments and regulatory authorities; Local authorities and municipalities; Ministries of food and agriculture; Ministries of climate; Ministries of energy
	Provide supplementary capacity building and training	Provide training and technical assistance to facility staff on pilot project implementation and monitoring processes.	Ministries of education and training; Facility staff; Ministries of climate; Ministries of energy

A.1.4.3 Steps to take to enact long-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Rollout of previously piloted food decarbonisation actions	Create a strategy for scaling the tested actions	Assess pilot performance against the evaluation framework to prioritise actions to be scaled. Develop a scaling strategy that is responsive to the unique characteristics of health care facilities, such as size, type, and location, whilst targeting facilities with the highest emissions and energy inefficiencies.	Ministries of health; Ministries of food and agriculture; Data analysts and consultants; Ministries of climate; Ministries of energy
	Design supporting policies to incentivise scaling	Develop incentive schemes that encourage health care facilities to adopt the chosen low carbon food practices, such as financial subsidies, recognition programs, or tax breaks for those meeting decarbonisation targets. Explore the opportunity to create mandatory guidelines or performance targets for food sourcing, waste management, and emissions reductions that all health care facilities must meet within a set timeframe. Ensure that these standards are aligned with the sector's overall decarbonisation goals.	Ministries of health; Ministries of finance/budget; Financial institutions; Local authorities and municipalities; Ministries of climate; Ministries of energy

Initiatives	Step	Step Description	Key stakeholders
	Securing funding and financing for wider rollout	Allocate sufficient resources for the large-scale rollout of successful actions. This could involve creating dedicated funding pots, using public-private partnerships, or offering financial incentives to facilities that adopt sustainable practices. Consider different types of funding models such as grants, subsidies, or competitive funding to ensure equitable access to the resources needed for rollout.	
Expansion of existing and new food decarbonisation actions	Increase the scaling of existing and new actions	Expand the scope of decarbonisation initiatives within the Belgian health care system by broadening the assets that qualify for decarbonisation efforts. Integrate the insights and lessons learned from previous action rollouts. Establish a structured feedback loop from earlier action pilots and rollouts. This could include reviewing successes, identifying challenges, and understanding areas for improvement. Create a centralised repository of lessons learned, case studies, and data from earlier actions to inform future rollouts and scale-ups. This could be shared through online platforms or workshops for health care providers.	Data analysts and consultants; Ministries of education and training; Ministries of climate; Ministries of energy
	Scale up funding and resources	Secure funding for the broader rollout of decarbonisation actions. This may involve increasing government funding or creating financial incentives (e.g., subsidies or grants) for facilities to adopt sustainable practices.	Ministries of health; Ministries of finance; Financial institutions; Local authorities and municipalities; Ministries of climate; Ministries of energy

A.1.5   Action area 5: Incentivise and produce low-carbon pharmaceuticals

A.1.5.1   Steps to take to enact short-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Engage with suppliers to gather product level GHG emissions data for key products	Develop an inventory of product level GHG emissions data for key products	Develop a user-friendly and secure data repository that can host pharmaceutical product data from EPDs, with set data verification and validation protocols. Ensure that the platform is open to contributions from pharmaceutical companies and health care entities across in Belgium. The data provided on the platform must be accurate, up-to-date, and transparent, offering reliable life cycle analysis data for all pharmaceutical products included in the system.	Stakeholders for medicines and health products; Ministry of health; Digital and data experts and IT developers; Pharmaceutical manufacturers; Ministries of climate; Ministries of energy
	Assess the cost implications of substitution	Conduct a detailed cost-benefit analysis to understand how switching to low-carbon pharmaceuticals would impact overall health care spending. Consider factor such as production, storage, and distribution expenses. Evaluate budgetary impacts of low-carbon pharmaceutical substitution on different health care providers.	
Review existing initiatives and standards supporting pharmaceutical sector decarbonisation	Screen existing initiatives and standards supporting pharmaceutical sector decarbonisation	Systematically screen for policy, industry initiatives, and sustainability standards which are encouraging pharmaceutical product developers to decarbonise their products. Ensure this assessment reviews both demand-based mechanisms that incentivise low-carbon product procurement such as mandatory carbon limits or emissions assessment criteria into tender processes and product authorisation protocols, as well as supply-side measures that directly assist manufacturers with decarbonisation actions.	Industry experts and consultants; Ministries of climate; Ministries of energy;
	Financial mechanisms to encourage sustainable innovation	Assess the creation of specific funding streams or innovation challenges to incentivise the development of low-carbon pharmaceutical products, particularly for drug categories with limited low-carbon alternatives. Leverage governmental incentives and regulatory pressures (e.g. subsidies, taxes, PPPs, low-carbon grants).	Ministries of finance/budget; Ministries of health and environment; Financial institutions; Ministries of climate; Ministries of energy
	Explore regulatory actions	Encourage efficiency in product consumption through regulatory actions (e.g. extending shelf life or revising expiry dates, adjusting storage temperatures where feasible, and revising packaging designs to reduce emissions).	Government and regulatory authorities/ EU-level; Ministries of climate; Ministries of energy

Initiatives	Step	Step Description	Key stakeholders
	Stakeholder consultation	Hold consultations with pharmaceutical companies, health care providers, and environmental experts to ensure broad stakeholder input in evaluating and screening potential actions.	Pharmaceutical manufacturers/ companies; Health care providers; Environmental experts; Ministries of climate; Ministries of energy

A.1.5.2 Steps to take to enact medium-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Integrate product level GHG data into pharmaceutical procurement guidelines	Develop a framework for integrating GHG data into procurement criteria	Establish a standard methodology for assessing the GHG emissions of pharmaceutical products, aligned with international standards such as the Greenhouse Gas Protocol. Define thresholds for low-carbon products that align with existing clinical and cost-effectiveness criteria.	Ministry of health; Pharmaceutical manufacturers/ companies; Health care providers; Industry experts and consultants; Ministries of climate; Ministries of energy
	Pilot application of the guidelines in select facilities	Pilot the revised procurement guidelines in selected health care facilities or for specific categories of pharmaceuticals. Train procurement teams and health care administrators on incorporating GHG data into decision-making. Collect feedback from health care professionals and procurement teams to refine the process.	Ministries of health; Health care providers; Industry experts and consultants; Ministries of climate; Ministries of energy
	Mandate data collection and reporting from suppliers	Include requirements in procurement contracts for pharmaceutical suppliers to provide product-level GHG emissions data. Ensure data consistency and transparency by specifying reporting formats and verification mechanisms. Regularly review the procurement data to assess the adoption of low-carbon products and identify opportunities for further optimization.	Ministries of health; Health care providers; Industry experts and consultants; Ministries of climate; Ministries of energy

A.1.5.3 Steps to take to enact long-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Engage with high-emission suppliers to prioritise decarbonisation	Identify high-emission suppliers and products critical to care delivery	Analyse GHG data collected from suppliers to identify those with the highest emissions profiles, focusing on products essential to health care delivery. Prioritise engagement based on emissions impact, clinical importance, and supplier readiness to collaborate.	Ministries of health and environment; Pharmaceutical manufacturers/ companies; Ministries of climate; Ministries of energy

Initiatives	Step	Step Description	Key stakeholders
of products critical to care delivery	Facilitate supplier engagement and capacity building	Organise workshops, dialogues, or one-to-one consultations with high-emission suppliers to share insights on emissions reduction opportunities and best practices. Provide technical support or connect suppliers with resources to help identify decarbonisation opportunities, such as transitioning to renewable energy, process optimisation, or adopting circular economy principles.	Ministries of health/environment; Pharmaceutical manufacturers/companies; Industry experts and consultants; Ministries of climate; Ministries of energy
	Develop partnerships to overcome barriers to decarbonisation	Explore co-investment opportunities or collaborative programmes to address financing or technological constraints faced by suppliers. Establish long-term supplier performance monitoring systems to track progress against emissions reduction targets. Integrate supplier performance on emissions into procurement scoring systems, rewarding progress while maintaining clinical and cost priorities.	Ministries of health/environment; Pharmaceutical manufacturers/companies; Industry experts and consultants; Ministries of climate; Ministries of energy

A.1.6 Action area 6: Implement circular health care and sustainable health care waste management

A.1.6.1 Steps to take to enact short-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Baselining circularity performance	Defining the baseline assessment scope and metrics	Clearly outline the scope of the baseline assessment, including specific areas of focus (e.g., waste streams, procurement models, product lifecycle management). Develop standardised indicators for circularity, such as percentage of reusable vs. single-use items, resource recovery rates, and level of supplier engagement in circular practices.	Ministries of health and environment; Ministries of economic affairs/ trade; Industry experts, data analysts and consultants; Ministries of finance/budget; Financial institutions; Ministries of climate; Ministries of energy
	Establish consistent reporting requirements	Create standardised reporting templates and guidelines for health care facilities to ensure consistency in data collection across entities. Determine the regularity of data collection, and timelines for submitting baseline data.	
	Establish quality control procedure	Set data quality standards for baseline data, focusing on accuracy, reliability and completeness. Implement procedures for validating and verifying data submitted by health care facilities to ensure accuracy and reliability. This could include spot-checks, cross-referencing with existing facility data, or follow-up consultations with facility managers.	
	Secure funding for baseline activities	Identify funding sources such as government grants and private sector partnerships. Allocate sufficient funding to cover the costs of conducting audits, developing digital reporting systems, and any necessary training or technical assistance for facilities participating in the assessment. Establish a funding timeline to support full duration of the baseline assessment, action screening and rollout.	
Circularity action screening	Develop evaluation criteria for screening	Establish clear criteria to evaluate each action based on potential for emissions reduction potential, scalability, cost implications, ease of integration into existing systems, and potential for resource recovery. Implement a multi-criteria assessment framework to score and rank actions. The framework should allow for weighted scoring based on the predefined criteria, helping to systematically evaluate the potential impact and feasibility of each action. Key actions to be screened include inventory management improvements, reducing single-use medical devices, minimising packaging waste, and exploring sustainable disposal alternatives (e.g., autoclaving, bio-digestion, and onsite composting).	Ministries of health/environment; Ministries of economic affairs; Industry experts, data analysts and consultants; Health care providers; Procurement managers; Suppliers; Ministry of finance; Ministries of climate; Ministries of energy
	Involve cross-sector stakeholders early on	Engage relevant stakeholders, including health care providers, procurement managers, waste management companies, and suppliers, to gather diverse perspectives on potential circularity actions. Early engagement ensures that the screening is comprehensive and grounded in real-world constraints and needs.	

Initiatives	Step	Step Description	Key stakeholders
		Consider forming an advisory group with representatives from key stakeholders, including health care, environmental, and procurement experts, to provide guidance and input throughout the screening process.	
	Allocate resources and budget for screening	Ensure adequate funding and resources are allocated for the entire screening process, including staffing, data collection, stakeholder engagement, and advisory consultations. Allocate specific budget lines for any technical or expert assistance required.	

A.1.6.2 Steps to take to enact medium-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Piloting of priority circularity actions	Develop standardised evaluation	Create a set of standardised criteria for assessing each action (e.g. emissions reduction potential, scalability, cost implications, ease of integration into existing systems, and potential for resource recovery). Create consistent reporting tools to track pilot data across health care facilities. Set up feed-back loops to capture qualitative and quantitative insights on piloted actions.	Industry experts, data analysts and consultants; Ministries of climate; Ministries of energy
	Resource allocation and funding for pilots	Identify and allocate dedicated funding for each pilot to cover costs associated with infrastructure, staffing, technology, and ongoing monitoring. Funding may include a mix of public funding, grants, or incentives to encourage participation and collaboration from health care facilities and suppliers, and to cover initial setup costs for piloted actions	Ministries of health/environment; Ministries of finance/budget; Financial institutions; Ministries of climate; Ministries of energy
	Explore the potential for regulatory flexibility for piloting	Identify regulatory barriers such as restrictions on reusing or recycling medical equipment. Engage with regulators to explore temporary waivers of flexibility on the implementation of circular pilots, if necessary and deemed safe. Gain insight into the long-term regulatory adjustments needed to support circular practices.	Government and regulatory authorities; Local authorities and municipalities; Ministries of climate; Ministries of energy
	Implement training for pilot participants	Provide training for health care facility staff involved in the pilots, covering waste segregation, use of new circular technologies, product lifecycle management, and compliance with circularity practices. Consider innovative training approaches, such as collaborative workshops, refresher sessions, and forums for health care providers to collaborate on training.	Ministries of health and environment; Health care facility staff; Industry experts and consultants; Ministries of climate; Ministries of energy

Initiatives	Step	Step Description	Key stakeholders
Rollout of tested circularity actions	Develop a rollout plan	Create a structured timeline for rolling out actions across health care facilities. Set clear milestones and periodic evaluation points to monitor progress, address challenges, and optimise the rollout strategy as needed.	Ministries of health and environment; Industry experts and consultants; Ministries of finance/budget; Financial institutions; Government and regulatory authorities; Ministries of climate; Ministries of energy
	Secure resource allocations and funding mechanisms	Ensure that sufficient funding is allocated to support the full-scale implementation of actions, including infrastructure upgrades, technology acquisition, and training. Consider offering financial incentives, grants, or subsidies to health care facilities that commit to adopting circular practices, offsetting any initial implementation costs.	
	Provide training on circular practices and protocols	Develop comprehensive training modules to ensure health care staff understand and adhere to new circularity protocols, from waste segregation to handling reusable devices.	
	Foster knowledge exchange among facilities	Create channels for facilities to share best practices, insights, and lessons learned during the rollout, fostering a collaborative approach to sustainability.	
	Adapt regulations to encourage reusable medical devices.	Adjust regulatory requirements, where possible, to facilitate the safe use and maintenance of reusable medical devices, minimising the need for single-use items.	
Scaling of circularity action rollout	Develop a phased scaling strategy	Design a structured plan for scaling actions, focusing on different categories of facilities (e.g., hospitals, clinics, long-term care) and ensuring a manageable, phased approach to avoid operational disruption.	Ministries of health; Industry experts and consultants; Ministries of finance/budget; Financial institutions; Government and regulatory authorities; Procurement stakeholders and suppliers; Ministries of climate; Ministries of energy
	Establish a dedicated fund for expanded actions	Secure a dedicated budget to support the additional costs of scaling, covering new action rollouts, necessary infrastructure upgrades, and technology adoption.	
	Establish circularity standards and compliance requirements	Develop standards for circular practices in health care, such as waste reduction targets, EPR compliance, and materials management guidelines	

Initiatives	Step	Step Description	Key stakeholders
	Integrate circularity in procurement policies	Update procurement guidelines to prioritise circular options, including product-as-a-service models, reusable materials, and suppliers who participate in take-back programs.	

A.1.7 Action area 7: Establish greater health system effectiveness, eliminating inefficient and unnecessary practices

Initiatives	Step	Step Description	Key stakeholders
Health care system effectiveness diagnosis	Data collection and system mapping	Establish mechanisms for the systematic collection of data on health care delivery practices, outcomes, carbon emissions, and resource utilisation. This includes gathering data on prescribing patterns, care pathways, and patient outcomes.	Ministries of health environment and or climate; Health care providers; Data analysts and consultants; Health insurers; Ministries of energy
	Establish metrics and benchmarks	Develop clear metrics to assess the effectiveness of care in health care services. This includes defining performance indicators for quality of care, resource efficiency, and environmental impact. Set baseline measurements and benchmarks accordingly.	
	Stakeholder consultation and collaboration	Involve a broad range of stakeholders, including health care providers, health insurers, environmental experts, and patient advocacy groups, in the diagnostic process. Their insights should ensure that the diagnosis reflects both the realities of health care delivery and broader societal goals.	
Screening of actions to improve system effectiveness	Establish a screening framework	Develop a structured framework to screen potential actions across clinical practices and facilities, focusing on identifying actions that reduce inefficiencies, eliminate unnecessary practices, and align carbon reduction with quality of care. Actions should be examined across various health care domains including clinical practices, health care facilities, supply chains, and the broader economy	Ministries of health; Health care providers; Data analysts and consultants; Health insurers; Industry experts and working groups; Ministries of climate; Ministries of energy
	Engage stakeholders and convene dedicated working groups	Involve a broad range of stakeholders in the screening process, including health care providers, patient advocacy groups, sustainability experts, insurers, and suppliers. Their input is critical to ensuring the feasibility and effectiveness of the proposed actions. Create advisory committees or working groups to oversee the screening process and ensure that actions align with broader national health and sustainability goals.	

Initiatives	Step	Step Description	Key stakeholders
Piloting of actions to improve system effectiveness	Development of evaluation criteria for shortlisting piloted actions	Establish clear evaluation criteria to assess which actions should be prioritised for piloting. This could include factors such as anticipated impact on carbon emissions, health care quality improvements, and cost-effectiveness.	Ministries of health, environment and or climate; Ministries of energy; Health care providers; Industry experts and consultants; Industry experts and working groups; Ministries of finance/budget; Financial institutions
	Selection of pilot sites	Identify and select health care facilities (hospitals, clinics, or regions) that are suitable for piloting the screened actions. Consider diverse health care settings to ensure that the actions are tested across a variety of conditions, such as urban vs. rural settings, public vs. private providers, and different specialties. Ensure that selected pilot sites have the necessary infrastructure, resources, and stakeholder buy-in to support the actions.	
	Engagement of key stakeholders	Involve all relevant stakeholders, including health care providers, patients, insurers, suppliers, and environmental experts, in the planning and execution of the pilot projects. Collaboration with stakeholders should ensure that the actions are practically feasible and that they meet the needs of all involved parties.	
	Resource allocation and budgeting	Allocate sufficient resources (funding, staff, training) to support the pilots, including potential funding for infrastructure upgrades, technology adoption, and staff time. Develop a clear budget plan for the pilot phase, including costs for monitoring, evaluation, and stakeholder engagement, and ensure that the pilots are cost-effective while achieving meaningful results	

A.1.7.3   Steps to take to enact long-term initiatives

Initiatives	Step	Step Description	Key stakeholders
Rollout of tested actions	National strategy for rollout	Develop a comprehensive, phased national strategy for the rollout, including timelines, key milestones, and the allocation of resources. This strategy should clearly outline the steps required to integrate the actions into routine health care delivery across different regions and health care settings. Ensure that the strategy accommodates variations in regional health care infrastructures and capacities, allowing for tailored approaches where necessary.	Ministries of health, environment and/or climate; Ministries of energy; Industry experts and consultants; Industry experts and working groups
	Policy and regulatory alignment	Review and update existing policies, guidelines, and regulations to facilitate the integration of the tested actions. This may include revising reimbursement structures, introducing new regulatory frameworks, and aligning health care quality standards with sustainability and climate goals.	Government and regulatory authorities; Local authorities and municipalities; Ministries of climate; Ministries of energy

Initiatives	Step	Step Description	Key stakeholders
		Remove regulatory barriers preventing the scaling of successful actions, particularly those related to low-carbon care pathways, telehealth, and sustainable procurement practices.	
	Incentivising health care providers	Introduce financial and non-financial incentives to encourage health care providers to adopt the new actions. These incentives could include performance-based funding, preferential reimbursement rates for low-carbon care models, or public recognition for facilities leading the way in sustainability.	Ministries of finance/budget; Financial institutions; Ministries of health and environment; Ministries of climate; Ministries of energy
	Training and capacity building	Invest in the training and professional development of health care workers, including doctors, nurses, administrators, and support staff, to ensure they understand the rationale behind the actions and how to implement them. Training should focus on integrating sustainability into clinical and operational practices.	Health care workers; Ministries of climate; Ministries of energy
Scaling of health system efficiency action rollout	Develop a scalable implementation plan	Create a phased, national plan for the scaling process, with clear milestones, timelines, and specific goals for each health care facility or region. This strategy should ensure that all regions, from urban to rural, are considered and appropriately supported.	Stakeholders/ Ministries of health; Industry experts and consultants; Ministries of finance/budget; Financial institutions; Health care workers; Ministries of climate; Ministries of energy
	Resource allocation and financial support	Ensure that sufficient financial resources are allocated for the scaling of actions, including funding for infrastructure, technology, training, and incentives for health care providers. Offer grants, low-interest loans, or performance-based funding to facilities and practices that need financial assistance to implement low-carbon solutions at scale.	
	Train health care workers on new actions	Expand training programmes for health care workers at all levels to ensure they understand the new actions, their benefits, and how to implement them effectively.	
	Build institutional capacity	Develop the institutional capacity within health care systems to manage the scaling process, including project management teams, operational staff, and sustainability coordinators in health care facilities.	
	Establish feedback loops	Create systems for health care providers to provide feedback on the challenges and successes they encounter when scaling the actions. This feedback should be used to make continuous adjustments to the rollout plan.	

A.2   Action area indicators

Table 2. Non-exhaustive list of action area metrics

Action name	Output indicator	Impact indicator
Power health care with 100% clean, renewable electricity		
Renewable energy consumption; Power Purchase Agreements (PPAs)	Total energy use intensity (GWh/m^2) Average energy use intensity (GWh/m^2) Share of renewable in total energy consumption (%) Fossil fuels consumption for heating and cooling in buildings (GWh/m^2) Share of industrial energy consumption from renewable energy (%)	Reduced annual CO_2 equivalent emissions per capita and per unit of GDP Reduced energy consumption Reduced concentrations of PM2.5, PM10, NOx and CO[3]
On-site renewable energy generation	Annual solar energy generation (GWh/ year) Annual wind energy generation (GWh/ year) Annual district heating energy generation (GWh/year)	Reduced annual CO_2 equivalent emissions per capita and per unit of GDP Reduced concentrations of PM2.5, PM10, NOx and CO[3]
Demand-side Management Strategies, Including Advanced Load Monitoring and Control	Total energy demand reduction (% reduction compared to baseline) Share of electricity demand met during peak hours through load shifting (%) Peak energy load reduction during critical hours (MW or %) Energy savings from optimized demand-side management (GWh/year)	Reduced annual CO2 equivalent emissions per capita and per unit of GDP Reduced concentrations of PM2.5, PM10, NOx and CO[3]
Invest in zero emissions buildings and infrastructure		
Energy efficiency upgrades to lighting, HVAC systems, insulation and windows; Smart energy management systems	Gross floor area of all nearly-zero energy and zero-emission buildings (m2) Total energy use intensity of buildings (kWh/m^2) Energy performance certificates attained by buildings, based on standardised assessments	Reduced annual CO_2 emissions attributed to buildings Reduced concentrations of PM2.5, PM10, NOx and CO[3]
Electrification of heating	Quantities of heating, cooling and steam purchased on-site (kWh/m^2) Quantities (e.g., propane, butane, diesel, biodiesel, heating oil, woodchips etc.) of any other fuels consumed on-site (kWh/m^2) Gas consumed on-site (m^3/ m^2) Electricity purchased (kWh/m^2)	Reduced annual CO2 emissions attributed to buildings Reduced concentrations of PM2.5, PM10, NOx and CO[3]

Use of low-carbon, durable construction materials	Proportion of construction alternative or bio-based materials (%) Proportion of materials purchased that are secondary (%)[6]	Reduced annual CO2 emissions attributed to construction
Reutilisation or repurposing of building materials like steel girders in refurbishment projects	Proportion of refurbished building materials (%)	Reduced annual CO2 emissions attributed to construction
Transition to zero emissions, sustainable travel, and transport		
Transitions to EVs and biofuels, including the infrastructure needs	Number of zero-emission cars, buses and ambulances Number of total vehicle fleet Number of publicly available electric charging vehicles Share of zero-emission vehicles by vehicle type in total fleet (%) Direct (tailpipe) CO_2 emissions (tonnes)[6] Quantities of fuel used, by vehicle fuel type (litre)	Reduced annual CO2 emissions from transport per capita Reduced concentrations of PM2.5, PM10, NOx and CO[3] Improved access to sustainable mobility
Active and public transport use and incentives	Modal share of active transport for staff, patients and visitors (%) Modal share of public transport for staff, patients and visitors (%) Share of staff, patients and visitors with access to public transport within 15min by foot (%) Average number of days spent working from health care facilities per year Number of patients travelling to in-patient facilities per day Distance travelled, by mode of transport (e.g., national flights, international flights, international rail, national rail, light rail, car, taxis, bus, ferries, trains, etc.) (km)	Reduced annual CO2 emissions from transport per capita Reduced concentrations of PM2.5, PM10, NOx and CO[3] Improved access to sustainable mobility
Implentation of telemedicine	Consultations conducted via telemedicine compared to traditional in-person visits (%) Number of avoided hospital visits	Reduced annual CO2 emissions from transport per capita Reduced concentrations of PM2.5, PM10, NOx and CO[3]

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[6] As outlined in the EU taxonomy to align with best practice reporting frameworks: Commission Delegated Regulation (EU) 2021/ of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives

Provide healthy, sustainably grown food and support climate resilient agriculture		
Encouraging plant-based options	Proportion of total meals served that are vegetarian (count/ week) Quantity of plant-based ingredients purchased (tonnes) Quantity of meat and dairy ingredients purchased (tonnes) Number of educational sessions conducted to train staff on preparing and promoting vegetarian meals	Reduced annual CO_2 emissions from food, per capita Increased Reduced concentration of methane emissions generated from landfill
Promoting food waste reduction	Proportion of food waste generated by the health care's food services (%) Food waste treated in sorting, processing, and treatment plants (%) Food waste disposed in sanitary landfills (%)	Reduced annual CO_2 emissions generated from food waste Reduced concentration of methane emissions generated from landfill
Incentivise and produce low-carbon pharmaceuticals		
Reducing the emissions intensity of pharmaceuticals	Proportion of low-carbon inhalers in total inhalers count (%) Quantities of propellant MDIs prescribed or used Quantities of other MDIs prescribed or used (e.g., dry powder inhalers) Carbon intensity of pharmaceutical production (kg CO_2e per unit) Percentage of procurement from suppliers with Science-based Targets (%) Reduction in over-prescription of pharmaceuticals (%) Refrigerant leakage, by refrigerant type(s) (kg) Quantities of anaesthetic used, by type	Reduced annual CO_2 emissions generated from pharmaceuticals, per capita or unit of GDP Reduced annual CO_2 emissions from pharmaceuticals production and use Reduced toxic emissions from pharmaceutical waste disposal
Extending shelf life or revising expiry dates of pharmaceuticals	Proportion of pharmaceuticals wasted, unused, or disposed (%) Quantity of pharmaceutical products produced (tonnes)	Reduced concentration of methane emissions generated from landfill
Implement circular health care and sustainable health care waste management		
Waste segregation and increased sustainable waste management;	Waste treated in sorting, processing and treatment plants by waste stream (e.g. MSW, medical waste) (%)	Reduced concentration of methane emissions generated from landfill

On-site composting and alternative waste management	Waste disposed of in sanitary landfills by waste stream (e.g. MSW, medical waste, paper products, plactics, etc.) (%) Waste disposed of by incineration by waste stream (e.g. MSW, medical waste, paper products, plactics, etc.) (%) Total waste produced annually by waste stream (e.g. MSW, medical waste, paper products, plastic etc.) (tonnes) Quantities of wastewater treated (m^3)	
Material recovery systems to facilitate return and recycling of medical devices	Proportion of medical devices waste recycled as a share of total medical devices waste produced (%) Proportion of dry recyclables (%) Average lifespan of medical equipment (years)	Reduced annual CO_2 emissions generated from disposed medical devices, per capita or unit of GDP Increased recycling rates and reduced landfill dependency
Establish greater health system effectiveness		
Promotion of preventive care and reduction of unnecessary treatment	Reduction in unnecessary medical procedures (%) Increase in preventive and early intervention services care (%) Patient satisfaction with health services (%) Carbon intensity of health care per patient (kg CO_2e per patient visit)	Reduced CO_2 emissions per health service provided Maintained quality care standards Reduced incidence of chronic diseases
Incorporating sustainability into procurement and service delivery processes	Total products procured by product type (tonne) Proportion of products by product type that have declared EPDs (%) Proportion of suppliers that have declared EPDs (%) Proportion of products by product type that have lifecycle assessments (LCAs) (%) Proportion of suppliers that have lifecycle assessments (LCAs) (%)	Reduced annual CO_2 emissions generated from procurement, per capita or unit of GDP

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