

Guide to Climate Change Adaptation for NHS boards

Scottish Health Technical Note

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NHS Scotland Assure

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Executive Summary

Climate change is already affecting the UK's health, infrastructure, public services and economy, and further impacts are inevitable. The Climate Change Committee's Fourth Independent Assessment of UK Climate Risk identifies that the UK should prepare, at a minimum, for weather extremes associated with around 2°C of global warming by 2050, while considering higher-end scenarios where appropriate. For NHS Scotland, this means planning for more frequent and severe heat, flooding, water stress, storm disruption, other climate-related hazards, including cascading infrastructure impacts that may affect patient safety, service continuity, staff wellbeing, access to care and vulnerable populations (see ref 1).

This Scottish Health Technical Note (SHTN 02-03) provides a practical framework to support NHS boards in preparing for, responding to and adapting to these risks. It is intended to help NHS boards take a consistent, proportionate and evidence informed approach to climate change adaptation, while aligning with statutory duties, national policy and recognised international guidance.

The guidance sets out the Adaptation Framework for NHS Scotland: a five-phase adaptation cycle comprising:

- **Phase 1 Preplanning: Laying the Foundations**
Establish governance, leadership scope, stakeholder engagement and organisational readiness.
- **Phase 2 Understanding Climate Risks and Opportunities**
Review climate risks, assess exposure and vulnerability, identify critical services and vulnerable populations, and recognise strategic opportunities.
- **Phase 3 Preparing for Action – Developing the Adaptation Plan (AP)**
Define adaptation objectives, identify and appraise options, group actions for delivery, and formalise the NHS board AP.
- **Phase 4 Implementation and Embedding Adaptation**
Mobilise resources and capacity, deliver actions, embed adaptation within existing business processes, work with partners, and integrate adaptation into wider planning arrangements.
- **Phase 5 Monitoring, Evaluation and Continuous Improvement.**
Monitor progress, evaluate effectiveness, review and update actions, and support learning across NHS Scotland.

The guidance emphasises that adaptation should not be treated as a standalone environmental initiative. Effective adaptation requires board-level oversight and coordinated action across estates, clinical services, emergency preparedness, public health, procurement, finance, workforce, digital systems and partner organisations. It should be integrated into existing governance, risk management, planning and assurance processes wherever possible.

The framework is designed to be flexible and scalable. NHS boards differ in size, geography, estate profile, service configuration and existing capacity, and adaptation should therefore be applied in a way that is proportionate to local context while maintaining consistency with national expectations. The guidance does not replace detailed technical standards, statutory risk assessments or emergency planning requirements. Rather, it provides a structure for ensuring that climate adaptation is addressed systematically across these standards and requirements.

The intended outcome is that NHS boards are better able to anticipate climate-related risks, protect patients and staff, maintain continuity of essential services, strengthen the resilience of assets and infrastructure and support long-term, sustainable healthcare delivery in a changing climate.

1. Introduction

- 1.1. Climate change is already affecting the conditions in which health services operate. The UK's Fourth Independent Assessment of UK Climate Risk highlights that the UK is experiencing serious climate impacts now, with further impacts inevitable over coming decades (see Ref 2). For health and care systems, the Climate Change Risk Assessment CCRA4-IA identifies heat and flooding as key risks to the delivery of quality and accessible care, while also recognising wider risks from other climate-related hazards and cascading dependencies, including disruptions to energy, water, digital, transport and supply chain systems. These impacts have the potential to disrupt clinical services, compromise patient safety, affect staff wellbeing and increase pressure on services supporting vulnerable populations.
- 1.2. Adaptation planning helps NHS boards anticipate the impacts of climate change, understand potential vulnerabilities across services and estates, and take proactive steps to avoid or minimise disruption. At the same time, adaptation offers opportunities to improve patient outcomes, increase operational efficiency, enhance staff wellbeing, protect infrastructure, and support the wider sustainability ambitions of NHS Scotland, including alignment with net zero objectives. While mitigation focuses on reducing greenhouse gas emissions, adaptation focuses on preparing services, infrastructure and decision-making for current and future climate impacts. Both are necessary to support a resilient and sustainable health system.
- 1.3. This Scottish Health Technical Note (SHTN 02-03) has been developed to support NHS boards in meeting statutory and policy obligations relating to climate change adaptation and in understanding, planning, and implementing effective responses to the impacts of climate change. It provides a practical, structured framework, referred to in this guidance as the Adaptation Framework for NHS Scotland. The framework is informed by recognised international guidance, including International Organization for Standardization (ISO) 14090, ISO 14091, the World Health Organization's (WHO's) climate resilience frameworks, and learning from health systems in the UK and internationally, while being tailored to Scotland's policy context, governance arrangements, and operational realities.
- 1.4. This guidance should be read alongside other relevant NHS Scotland technical standards, including the SHTN 02-01 Sustainable Design and Construction (SDaC) Guide and Health Building Note (HBN) 00-07 Planning for a Resilient Healthcare Estate, which provide complementary technical guidance relating to sustainable design, energy hierarchy and estate resilience. This guidance does not replace detailed technical estate guidance, statutory risk assessments or emergency planning requirements; rather, it provides a

framework for ensuring that climate adaptation is addressed consistently across these processes.

- 1.5. This SHTN sets out how NHS boards can systematically assess climate-related risks and opportunities, develop and prioritise appropriate adaptation actions, and embed climate resilience into existing governance, planning and operational processes.

Purpose of this Guidance

- 1.6. This guidance sets out a consistent and proportionate minimum framework for NHS boards to plan for and respond to climate-related risks and opportunities.
- 1.7. The purpose of this guidance is to support NHS boards to:
- understand the potential impacts of climate change on healthcare services, assets, workforce and populations
 - meet statutory and policy obligations relating to climate change adaptation
 - take a consistent, evidence-based and proportionate approach to adaptation planning
 - integrate climate resilience into business-as-usual decision-making, including risk management, estates planning, capital investment, service transformation and emergency preparedness
 - strengthen organisational capability to respond to climate risks over time through monitoring, learning and continuous improvement

Who is this Guidance for?

- 1.8. This SHTN is intended for a wide range of roles across NHS Scotland, reflecting the cross-cutting and system-wide nature of climate adaptation. The primary audience includes:
- NHS board members and Executive Leadership Teams
 - Estates and Facilities Directors and teams
 - Capital Planning
 - Sustainability leads and teams
 - Clinical leaders and service managers
 - Emergency Planning and Resilience staff
 - Public Health teams
 - Digital, procurement, finance and workforce Leads.

- 1.9. Climate change adaptation is not the responsibility of a single team. Effective delivery requires NHS board-level oversight and coordinated action across estates, clinical, operational, public health, emergency planning, digital, procurement, finance, workforce and sustainability functions.

Why Adaptation Matters for NHS Scotland

- 1.10. Climate-related hazards have the potential to affect multiple aspects of healthcare delivery, including:
- the safety and performance of healthcare buildings and infrastructure
 - the continuity of critical clinical and support services
 - workforce availability, safety and wellbeing
 - access to healthcare for patients and communities, particularly during severe weather
 - demand for services associated with climate-sensitive health conditions
- 1.11. By acting early and strategically, NHS boards can reduce the likelihood and severity of future disruption, avoid higher costs associated with reactive responses, support continuity of essential health services, and ensure that services are better prepared for uncertainty.

Policy and Framework Alignment

- 1.12. This guidance aligns with relevant national legislation, strategic policy and recognised technical and international frameworks. Key alignments are outlined below.

Legislation and National Policy Context

- 1.13. This guidance supports NHS boards in meeting relevant statutory duties and aligning their adaptation activity with national policy, including:
- the Climate Change (Scotland) Act 2009 (see ref 3), as amended, and the associated Public Bodies Climate Change Duties (see ref 4)
 - the Scottish National Adaptation Plan (SNAP3) (see ref 5)
 - the NHS Scotland Climate Emergency and Sustainability Strategy (see ref 6)
 - policy for NHS Scotland on the Climate Emergency and Sustainable Development - Director Letter (DL) (2021) 38 (see ref 7)
- 1.14. Phase 1, under “Legal and Policy Requirements”, explains how these relate to NHS board adaptation activity.

International Adaptation and Resilience Frameworks

- 1.15. The structured approach set out in this guidance is informed by recognised international standards and frameworks, including:
- ISO 14090 - Adaptation to Climate Change (Principles, Requirements and Guidelines) (see ref 8)
 - ISO 14091 - Vulnerability, Impacts and Risk Assessment (see ref 9)
 - The WHO Operational framework for building climate resilient and low carbon health systems (see ref 10)

NHS Scotland Technical and Estate Guidance

- 1.16. This SHTN should be read alongside relevant NHS Scotland technical standards. It does not duplicate technical design requirements but provides a structured framework for integrating climate risk considerations into their application.
- 1.17. Relevant technical guidance includes:
- SHTN 02-01 SDaC, including energy hierarchy and whole-life carbon considerations (See Ref 11)
 - HBN 00-07 Planning for a Resilient Healthcare Estate, particularly in relation to infrastructure resilience and system interdependencies (See Ref 12)
 - applicable Scottish Health Technical Memoranda (SHTMs) relating to critical engineering systems (See Ref 13)
- 1.18. These documents should be used alongside this SHTN where more detailed technical, engineering design or assurance requirements apply.

How to use this Guidance

- 1.19. This guidance is structured around a five-phase adaptation cycle, reflecting the iterative nature of effective climate adaptation:
1. Phase 1 - Preplanning: Laying the Foundations
 2. Phase 2 - Understanding Climate Risks and Opportunities
 3. Phase 3 - Preparing for Action - Developing the Adaptation Plan (AP)
 4. Phase 4 - Implementation and Embedding Adaptation
 5. Phase 5 - Monitoring, Evaluation and Continuous Improvement

- 1.20. NHS boards may have existing activity underway in different parts of the cycle depending on their current level of maturity. However, effective adaptation requires that governance, scope and organisational readiness are established early and maintained throughout. The phases are not strictly linear and should be revisited as new information, climate projections, organisational changes or learning emerge.
- 1.21. This guidance complements, but does not replace, existing NHS Scotland technical standards, statutory requirements and established governance processes.

Use of key terms

- 1.22. To support consistent interpretation of this guidance, the following terms are used throughout:
- **must** is used where action is required to comply with legislation, statutory duties, national policy requirements or other mandatory requirements. It may also be used where this SHTN identifies an action as necessary to apply the adaptation framework effectively
 - **should** is used to indicate a recommended course of action. It describes what NHS boards are expected to consider or apply, while allowing for local context, proportionality and professional judgement
 - **may** is used to indicate that an action is permitted or available as an option within the scope of the guidance
 - **could** is used to provide examples, possible approaches or illustrative options. It does not indicate a requirement or formal recommendation
- 1.23. This guidance is intended to support a proportionate and flexible approach to adaptation planning and implementation. The use of these terms should therefore be understood in the context of local risk, organisational maturity, service profile and available evidence.
- 1.24. The distinction between these terms is intended to clarify the level of formal obligation within this guidance. It does not prevent NHS boards from taking additional or more ambitious action where this is justified by local risk, professional judgement, ethical responsibilities, health equity considerations, planetary health commitments or organisational priorities.

2. The Adaptation Framework for NHS Scotland

- 2.1. The Adaptation Framework for NHS Scotland provides a core structure for this guidance. It sets out a consistent and proportionate approach that NHS boards should use to prepare for, respond to and adapt to the impacts of climate change, while strengthening the resilience of services, assets and systems over time.
- 2.2. The framework reflects recognised international best practice, including International Organization for Standardization ISO 14090 and World Health Organization (WHO) guidance for climate resilient health systems, while being tailored to NHS Scotland's governance, assurance and operational context (see ref 8). It is designed to support NHS boards at different stages of maturity and to integrate adaptation into existing governance, risk management, planning and decision-making processes rather than creating parallel systems.
- 2.3. The framework sets out a minimum structure that all NHS boards should apply, while allowing flexibility in how this is implemented locally according to scale, risk profile, geography and organisational maturity.
- 2.4. At a minimum, NHS boards must:
- establish governance, accountability and scope for adaptation
 - identify and review relevant climate risks and opportunities
 - prioritise and formalise appropriate adaptation actions
 - embed adaptation within existing governance, planning and assurance processes
 - review progress, evaluate effectiveness and update actions over time

Overview of the Five Phases of Adaptation

- 2.5. The adaptation framework for NHS Scotland is structured around five interrelated phases, each of which plays a distinct role in building and maintaining climate resilience. Together, these phases provide a coherent process for moving from organisational readiness to risk understanding, action planning, implementation and continuous improvement.

Phase 1 Preplanning: Laying the Foundations

- 2.6. This phase focuses on establishing the organisational foundations required for effective adaptation. It supports NHS boards to understand the challenge, recognise gaps, identify key stakeholders, and secure early leadership commitment.

- 2.7. The aim of Phase 1 is to ensure that climate adaptation is recognised as a strategic priority and that appropriate governance, roles, scope, accountability and policy alignment are in place before moving forward.
- 2.8. Phase 1 underpins all subsequent phases and should be established early, even where NHS boards already have climate risk or sustainability activity underway.

Phase 2 Understanding Climate Risks and Opportunities

- 2.9. Phase 2 focuses on building a robust understanding of the climate risks and opportunities that NHS boards may face now and in the future. It supports NHS boards to identify climate hazards, determine where exposure exists, understand which assets, services, workforce groups and populations may be most vulnerable, and identify those risks and opportunities most likely to require action.

Phase 3 Preparing for Action - Developing the Adaptation Plan

- 2.10. This phase sets out how NHS boards can translate identified risks and opportunities into a structured and prioritised Adaptation Plan (AP). It focuses on identifying appropriate adaptation measures, assessing their feasibility and benefits, and defining clear objectives, actions, responsibilities and timescales.
- 2.11. Phase 3 ensures that adaptation planning is proportionate, evidence-based and aligned with organisational priorities, and provides a clear basis for implementation and monitoring.

Phase 4 Implementation and Embedding Adaptation

- 2.12. Implementation is where plans are put into practice. Building on the governance established in Phase 1 and the responsibilities and resource needs identified in Phase 3, this phase focuses on delivering adaptation measures, securing the resources and staff engagement needed for delivery, and embedding actions into existing processes.

Phase 5 Monitoring, Evaluation and Continuous Improvement

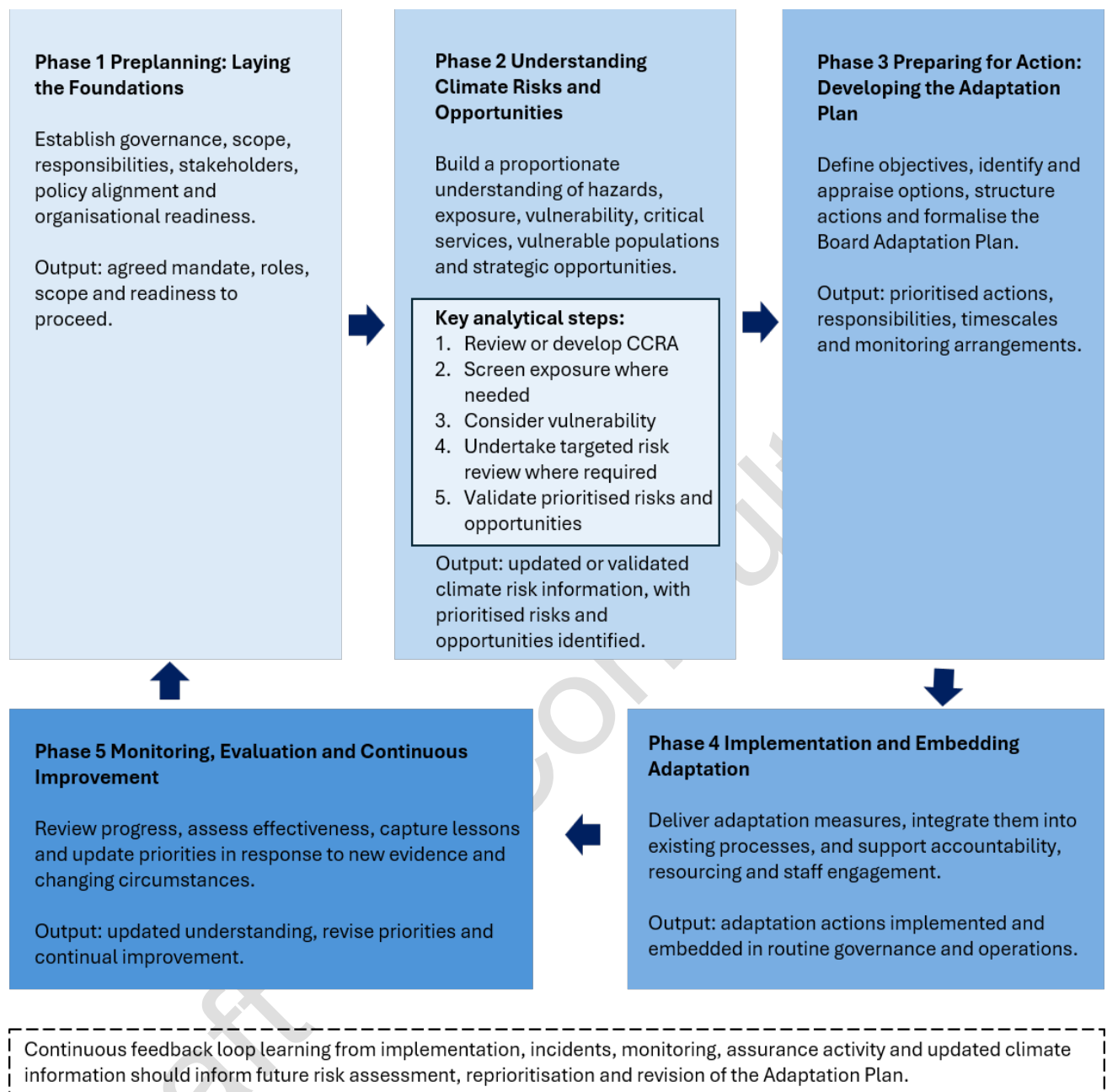
- 2.13. The final phase ensures that adaptation efforts remain effective and responsive over time. It involves establishing mechanisms to track progress, measure outcomes, and evaluate the effectiveness of actions. Continuous learning and feedback from this phase should inform future updates to plans and strategies, supporting a culture of ongoing resilience and improvement.

- 2.14. Monitoring and evaluation should inform updates to risk assessments, adaptation priorities and implementation arrangements over time.

The NHS Scotland Adaptation Cycle

- 2.15. Adaptation is not a one-off exercise. It is an iterative and continuous process that responds to changing climate projections, organisational priorities, and learning from experience.
- 2.16. The NHS Scotland Adaptation Framework should be understood as a cycle, in which:
- learning from implementation informs future risk assessment
 - monitoring and evaluation lead to refinement of actions
 - new evidence or events trigger reassessment of priorities
- 2.17. NHS boards may begin with different levels of existing activity, but the framework should be applied as a connected process rather than as a set of standalone tasks.
- 2.18. NHS boards may enter the cycle at different points depending on existing work, but all phases should be revisited periodically. This cyclical approach supports long-term resilience and avoids adaptation becoming outdated or disconnected from operational reality.
- 2.19. Figure 2.1 illustrates the five phases of the NHS Scotland Adaptation Cycle, summarising the main activities and outputs while showing how learning and new evidence feed back into the assessment and action.

Figure 2.1 The 5 phases of the NHS Scotland Adaptation Cycle



Principles of Effective Adaptation

- 2.20. The framework is underpinned by a set of core principles that should guide all adaptation activity within NHS Scotland. These principles reflect recognised international guidance and lessons identified through national and local experience.

Whole-System Approach

- 2.21. Adaptation should address the full health system, including estates, healthcare services, workforce, digital systems, supply chains, governance and partnerships, rather than focusing solely on physical assets.

Future-focused and risk-informed

- 2.22. Planning should be based on credible climate projections and hazard information, including relevant Met Office, UK Climate Projections (UKCPs) and Scottish Environment Protection Agency (SEPA) sources, alongside structured risk assessment and learning from past events, drawing where relevant on information from infrastructure providers and resilience partners.

Equity and Protection of Vulnerable Populations

- 2.23. Adaptation should explicitly consider how climate risks may disproportionately affect certain populations and services, supporting equitable health outcomes and reducing inequalities.

Evidence-led and Proportionate

- 2.24. Decisions should be informed by the best available evidence and tailored to the scale and significance of risk, recognising differing levels of capacity and maturity across NHS boards.

Integration with Business-as-Usual Processes

- 2.25. Adaptation should be embedded within existing governance, risk management, capital planning, service redesign and emergency planning processes.

Alignment with Sustainability and Net Zero Objectives

- 2.26. Where applicable, adaptation actions should complement emissions reduction and wider sustainability goals, delivering co-benefits for health, environment and value for money, and avoid maladaptation (see ref 6). For example, defaulting to mechanical cooling to manage overheating without considering feasible measures to reduce heat gains and provide passive cooling may increase energy demand and emissions (see ref 11).

Collaboration and Shared Responsibility

- 2.27. Effective adaptation requires collaboration across disciplines, organisations and sectors, with clear roles and shared ownership rather than reliance on a single function. Adaptation should not be treated as the responsibility of a single team, even where one function coordinates the process.

Continuous Learning and Improvement

- 2.28. Adaptation should evolve over time through monitoring, evaluation, learning from incidents, and sharing good practice across NHS Scotland.

Flexibility and Proportionality

- 2.29. The adaptation framework is designed to be flexible and scalable. NHS boards differ in size, geography, asset profile, service configuration, existing capability and exposure to climate risk. NHS boards should therefore apply the framework in a way that is proportionate to local context while maintaining consistency with national expectations.
- 2.30. NHS boards are encouraged to build capacity progressively, focusing first on priority risks and high-impact actions, and strengthening their approach over time.

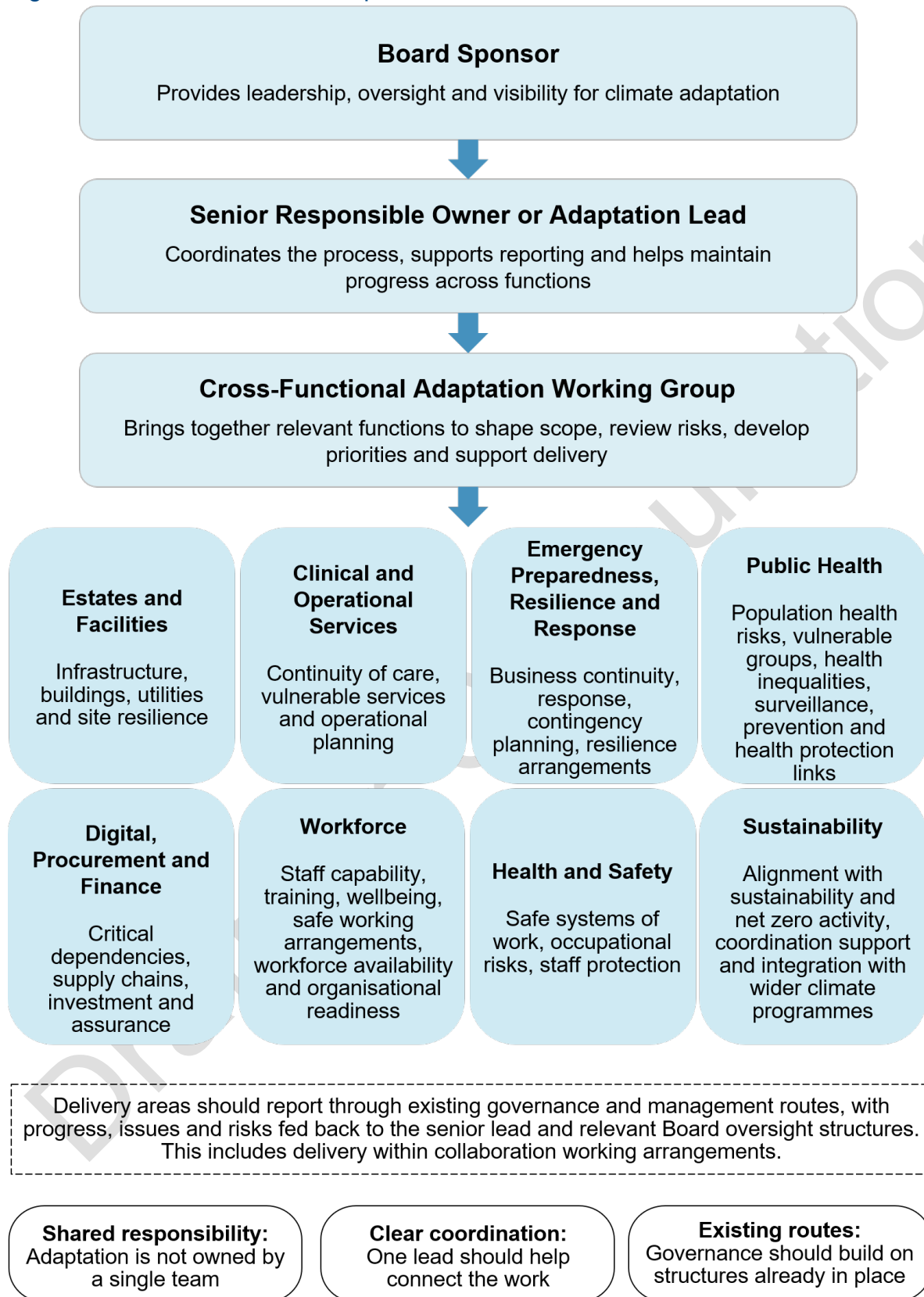
3. Phase 1 Preplanning: Laying the Foundations

- 3.1. Phase 1 establishes the organisational foundations required for effective climate change adaptation. Before undertaking a detailed climate change risk assessment (CCRA) or developing an Adaptation Plan (AP), NHS boards must ensure that appropriate governance, leadership, scope, and readiness are in place.
- 3.2. This phase is essential to ensure that adaptation is recognised as a strategic and operational responsibility across the organisation, rather than being treated as a standalone or single-team initiative.

Defining Governance and Responsibilities

- 3.3. Clear governance, accountability and leadership are essential for effective adaptation planning and delivery.
- 3.4. NHS boards should:
- appoint a NHS board-level director as sponsor with responsibility for overseeing climate adaptation activity
 - designate a senior responsible officer or adaptation lead to coordinate activity
 - establish a cross-functional adaptation working group, drawing representation from estates and facilities, clinical services, sustainability, emergency planning, public health, information technology, procurement, finance and workforce teams
 - ensure that adaptation responsibilities are reflected within existing governance, risk management and reporting structures
 - ensure that opportunities for adaptation are reflected within key collaborative working arrangements (for example within community planning partnerships and integration authorities)
 - clarify decision-making routes, reporting arrangements and escalation points for climate-related risks and adaptation actions
- 3.5. Roles and responsibilities must be clearly defined to ensure that adaptation is not confined to a single team but shared across the organisation. Governance arrangements should align with existing NHS board committees and reporting structures to support assurance and decision-making. One team or function may coordinate the process, but responsibility for delivery should sit across the relevant parts of the organisation. Figure 3.1 illustrates how oversight, coordination and delivery responsibilities may be structured in practice.

Figure 3.1 Governance and Responsibilities



3.6. Further illustrative detail on governance roles and responsibilities is provided in Appendix A.

Legal and Policy Requirements

- 3.7. NHS boards operate within a statutory and policy framework that requires them to consider and address the risks posed by climate change. Climate adaptation planning under this Scottish Health Technical Note (SHTN) supports compliance with these requirements and helps NHS boards to deliver safe, effective and resilient healthcare services under current and future climate conditions.

Scottish Legislation and Statutory Duties

- 3.8. Under section 44(1)(b) of the Climate Change (Scotland) Act 2009, as amended, NHS boards must, when exercising their functions, act in the way best calculated to help deliver the adaptation programme laid before the Scottish Parliament under section 53. The Scottish Government's 2026 statutory guidance identifies the Scottish National Adaptation Plan (SNAP3) as the current programme and states that public bodies must plan for the delivery of their functions and services in Scotland's changing climate and identify and support the SNAP3 objectives relevant to their functions.
- 3.9. The statutory guidance advises public bodies to undertake climate-related risk assessments, develop and implement adaptation plans, and include appropriate risks on their corporate risk registers to help demonstrate compliance with the adaptation duty (see ref 14).

Scottish National Adaptation Plan

- 3.10. The SNAP3 sets out national priorities and outcomes for adapting to climate change across Scotland. Health and social care are identified as critical sectors requiring proactive adaptation to protect population health, reduce service disruption, and maintain essential infrastructure (see ref 5).
- 3.11. NHS boards should identify the SNAP 3 objectives relevant to their functions and consider how local adaptation activity supports them. The Adaptation Plan developed in Phase 3 should record this connection.

Emergency Preparedness, Resilience and Response (EPRR)

- 3.12. Climate change is an increasingly important driver of emergencies and service disruption. NHS boards have responsibilities under the Civil Contingencies Act 2004 to prepare for and respond to emergencies, including those arising from severe weather and climate-related

hazards. Where climate-related hazards may give rise to emergencies or significant service disruption, NHS boards must ensure that relevant EPRR duties continue to be met.

- 3.13. Adaptation planning complements EPRR arrangements by supporting a shift from reactive response to proactive risk reduction, preparedness and long-term resilience. Climate-related risks and actions should be considered alongside wider organisational resilience, business continuity, operational planning, risk management and assurance arrangements.

NHS Scotland Policy Context

- 3.14. Climate adaptation activity should align with wider NHS Scotland policy, governance and assurance arrangements. NHS boards should ensure consistency with the NHS Scotland Climate Emergency and Sustainability Strategy 2022-2026, which sets out the national ambition to deliver sustainable, resilient health services while responding to the climate emergency. The Strategy recognises that climate change poses a material risk to the delivery of healthcare services and highlights the importance of adaptation alongside emissions reduction.
- 3.15. NHS boards must also have regard to NHS Scotland on the Climate Emergency and Sustainable Development – Director Letter (DL) (2021) 38, which requires NHS boards to embed climate change considerations into decision-making, governance, and assurance processes. This includes ensuring that climate risks and opportunities are appropriately identified, assessed and managed, and that progress is monitored, reported and escalated through established governance routes.

Identifying Stakeholders

- 3.16. Adaptation is inherently cross-cutting and requires collaboration across organisational boundaries and, where relevant, across partner organisations and systems.
- 3.17. Stakeholder identification should be proportionate to the scope of local adaptation activity, but should be broad enough to capture key operational, technical, clinical and external interdependencies.
- 3.18. NHS boards should identify and engage relevant stakeholders, which may include:
- Internal Stakeholders:
 - NHS board members and Executive Leadership Teams
 - Estates and Facilities Directors and teams
 - Capital Planning teams
 - Sustainability leads and teams

- Clinical leaders and service managers
- Emergency Planning and Resilience leads
- Public Health teams
- Digital and information technology leads.
- Procurement and supply chain leads
- Finance teams
- Workforce and health and safety teams
- External Stakeholders:
 - Local authorities
 - Local Resilience Partnerships
 - Public health partners
 - Utilities and infrastructure providers, including energy, water, transportation and communications
 - Community and voluntary organisations
 - Key contractors, suppliers or service partners where these support critical infrastructure or services

3.19. NHS boards should engage stakeholders according to their roles in estate risk, service delivery, emergency preparedness, infrastructure dependency, or decision-making authority.

3.20. Early engagement helps to build shared understanding, draw on operational knowledge, identify interdependencies and strengthen ownership of subsequent risk assessment and adaptation planning.

Establishing Scope, Boundaries and Priorities

3.21. Before progressing to detailed risk assessment, NHS boards should clearly define the scope, boundaries and intended level of detail of their adaptation activity, taking account of the full range of services, assets, populations and dependencies that may be affected by climate change.

3.22. This should include consideration of:

- assets - buildings, land, utilities, equipment and digital infrastructure
- services - acute, community, primary, mental health and support services
- people - patients, staff, contractors and volunteers
- dependencies - transport, energy, water, digital networks, supply chains and partner organisations

- 3.23. NHS boards should distinguish between the overall scope of adaptation planning and any phased approach used for more detailed assessment or action development. They should also clarify whether detailed work will initially apply across all sites and services, or whether a phased or prioritised approach is needed based on risk, capacity and organisational maturity.
- 3.24. NHS boards should also consider the time horizons relevant to their adaptation planning, including where short-, medium- and longer-term risks or actions may need to be reflected.
- 3.25. Clear scoping helps ensure subsequent phases are focused, proportionate, transparent and aligned with local priorities, capacity and risk profile.
- 3.26. The following example shows how overall scope and phased assessment may be approached proportionately.

Example: Defining scope and phasing assessment

An NHS board defines the overall scope of its adaptation activity as the acute and community services it provides, the buildings and digital systems that support them, patients and staff, and critical external dependencies such as energy, water, transport and suppliers. It considers short-, medium-, and longer-term climate risks. For the first detailed assessment, it prioritises its main acute site and community services used by vulnerable patients, based on service criticality and potential climate exposure. The NHS board records why these areas were prioritised and when other sites and services will be assessed; they remain within the overall scope.

Making the Case for Adaptation

- 3.27. Securing organisational commitment is critical to successful adaptation. NHS boards should establish a clear, credible and organisation-wide case for adaptation early in the process.
- 3.28. NHS boards must recognise climate change as a material strategic and operational risk to the delivery of healthcare services.
- 3.29. Projected changes in temperature, rainfall, storm intensity and sea level are expected to affect assets, service delivery and patient safety. Climate-related disruption is likely to interact with existing system pressures, including workforce capacity, service demand, infrastructure resilience and inequalities.
- 3.30. Relevant statutory, policy and governance responsibilities are described above under “Defining Governance and Responsibilities” and “Legal and Policy Requirements” and should inform the organisational case for adaptation.

- 3.31. NHS boards should recognise that adaptation is not the same as mitigation. Understanding this distinction helps ensure that climate resilience is addressed alongside, rather than assumed within, net zero activity. Mitigation and adaptation are distinct but complementary strategies. NHS Scotland needs mitigation to support net zero objectives and adaptation to ensure that services, infrastructure and decision-making remain resilient under changing climate conditions.

Table 3.1 Distinction between mitigation and adaptation

Mitigation	Adaptation
Reduces greenhouse gas emissions and supports NHS Scotland's net zero objectives.	Prepares NHS Scotland's services, estate and infrastructure for current and future climate impacts.
Focuses on lowering the organisation's contribution to climate change.	Focuses on reducing disruption, vulnerability and harm caused by climate-related hazards.
Example: improving energy efficiency or moving to low-carbon heat.	Example: reducing overheating risk in clinical areas or improving flood resilience at sites.

- 3.32. Some measures may support both mitigation and adaptation, while others involve trade-offs that NHS boards should assess together. For example, switching to electric heating may support emissions reduction but should also prompt consideration of electricity supply resilience and service continuity.
- 3.33. Making the case for adaptation within the organisation requires NHS boards to:
- acknowledge climate-related risks within corporate risk management processes
 - consider climate resilience within estate, capital and service planning decisions
 - integrate adaptation with existing sustainability and governance commitments
 - ensure leadership oversight and accountability for climate-related risks
 - communicate clearly that adaptation is a shared organisational responsibility and not solely a sustainability workstream
 - identify how adaptation supports patient safety, service continuity, statutory compliance and long-term value for money
- 3.34. Adaptation should be framed as a component of core business continuity, risk management service resilience and long-term planning rather than a standalone environmental initiative. Early and proportionate action to understand and manage climate risks supports safety, service reliability and long-term value for money. NHS boards should therefore establish a

clear organisational mandate for adaptation before progressing to detailed risk assessment and planning.

Understanding Organisational Adaptation Capability and Maturity

- 3.35. NHS boards vary in their experience, capacity and capability to plan for and respond to the potential impacts of climate change. Understanding an organisation's current level of adaptation capability is an important early step in ensuring that adaptation activity is proportionate, achievable and aligned with existing systems and resources.
- 3.36. As part of Phase 1, NHS boards should consider undertaking a high-level self-assessment of their organisational maturity in relation to climate change adaptation. This supports informed decision-making about priorities, sequencing, governance and resourcing in subsequent phases (see ref 15 and 16).
- 3.37. Adaptation Scotland's Public Sector [Climate Adaptation Capability Framework](#) provides a way to assess and develop organisational adaptation capability. NHS boards may use its associated Benchmarking Tool during Phase 1 to identify strengths and gaps. Its capability areas and maturity stages describe organisational progress and are distinct from the five phases of the Adaptation Framework for NHS Scotland set out in this SHTN. These resources can support NHS boards in applying this guidance.
- 3.38. The Climate Adaptation Capability Framework describes adaptation capability across several interrelated areas. Together, these provide a practical way for NHS boards to reflect on strengths and gaps. The key capability areas include:
- understanding the challenge
 - organisational culture, skills and resources
 - strategy, implementation and monitoring
 - working Together
- 3.39. NHS boards may find that capability varies across these areas. Understanding this variation can help to target improvement efforts and ensure that adaptation activity is realistic and effective.

Figure 3.2 - Climate Adaptation Capability Framework



Source: [Climate Adaptation Capability Framework - Adaptation Scotland](#)

- 3.40. The Adaptation Capability Levels include:
- starting - Limited awareness of climate risks; adaptation activity is largely ad hoc, with unclear roles and limited integration into governance or planning processes
 - intermediate - Climate risks are recognised and initial assessments, governance arrangements or actions are in place, but adaptation is not yet consistently embedded across the organisation
 - advanced - Adaptation is integrated into governance, risk management, estates and service planning, with defined responsibilities and regular review
 - mature - Adaptation is fully embedded across the organisation, supported by monitoring, evaluation and learning, and informs long-term investment, service transformation and strategic decision-making
- 3.41. NHS boards may use these levels as indicative descriptors, recognising that different services, sites or functions may be operating at different levels of maturity.
- 3.42. The designated adaptation lead should coordinate this high-level assessment with the cross-functional adaptation working group and relevant service and corporate leads reporting significant gaps through existing governance arrangements. Where the

assessment identifies a starting-level capability, the NHS board should agree proportionate actions to strengthen awareness, skills, responsibilities or resources, seeking external support where needed. The assessment should be revised periodically as adaptation activity develops.

Phase 1 Output: Organisational Readiness to Proceed

- 3.43. Before progressing to Phase 2, NHS boards must ensure that minimum governance, scope, stakeholder and organisational readiness arrangements are in place. Table 3.2 summarises the expected outputs from Phase 1.

Table 3.2 Phase 1 Output: Organisational Readiness to Proceed

Area	What should be in place
Governance and accountability	Defined governance structure, including NHS board-level oversight, a designated adaptation lead, and a cross-functional working group or equivalent coordination mechanism.
Policy and statutory alignment	Awareness of relevant legislation, policy and technical guidance, with adaptation linked to existing governance, risk management, assurance and planning processes.
Stakeholder engagement	Key internal and external stakeholders identified, with early engagement to support shared understanding of risks, responsibilities and dependencies.
Scope and boundaries	Clear definition of the assets, services, populations and dependencies within scope, recognising that this may be prioritised or phased.
Organisational mandate	Climate adaptation recognised as a relevant organisational issue and reflected, where appropriate, in corporate risk management, estate planning, service planning or resilience arrangements.
Capability and maturity	A high-level understanding of current organisational capability and maturity in relation to climate adaptation, including any significant gaps affecting readiness to proceed.
Reporting and escalation	Clear arrangements for reporting progress, escalating risks and linking adaptation activity into existing governance and decision-making routes.

- 3.44. Where these elements are not sufficiently in place, NHS boards should identify any significant gaps, agree who will address them and what support is needed, and take proportionate action before progressing to Phase 2. The preceding Phase 1 sections explain these arrangements in more detail, while Appendix D identifies relevant tools and resources.

4. Phase 2 Understanding Risks and Opportunities

- 4.1. The purpose of Phase 2 is to develop a structured, evidence-informed and proportionate understanding of how climate change could affect NHS Scotland's assets, services, workforce, and populations.
- 4.2. This phase supports NHS boards to:
- confirm relevant climate hazards
 - identify asset- and service-level exposure where necessary
 - refine risk understanding through consideration of vulnerability
 - identify vulnerable populations and critical services
 - recognise strategic opportunities and co-benefits
- 4.3. The approach is proportionate and risk-informed, consistent with recognised climate adaptation practice. It does not require duplication of existing risk assessments. In many cases, existing climate change risk assessment (CCRA) work will already provide a substantial foundation and not every board will require the same level of analysis in every area.
- 4.4. In practice, this phase may involve several related steps: reviewing the CCRA, exposure screening, vulnerability considerations, and more detailed targeted risk review only where this is justified by the significance or uncertainty of the risk (see ref 9). The outputs of this phase may include updated or validated climate risk information, improved understanding of exposure and vulnerability, identification of critical services and vulnerable populations, and prioritised risks and opportunities for action.
- 4.5. For clarity, this guidance uses the following terms to describe the main analytical steps within Phase 2.

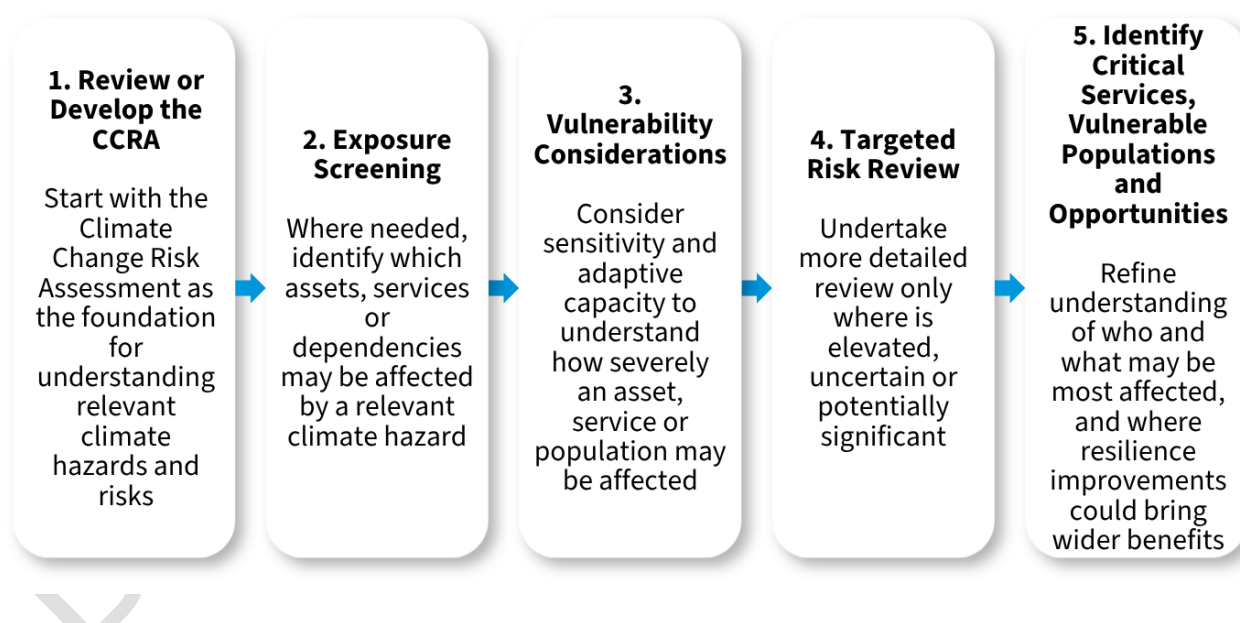
Table 4.1 Key terms used in Phase 2

Term	Meaning in this guidance
CCRA	Identifies and evaluates relevant climate-related risks and provides the starting point for Phase 2.
Exposure screening	Identifies whether assets, services or dependencies may be affected by a climate hazard.

Term	Meaning in this guidance
Vulnerability considerations	Considers how severely an asset, service or population may be affected, including sensitivity and adaptive capacity
Targeted risk review	More detailed review undertaken only where earlier steps indicate elevated, uncertain or potentially significant risk.
Adaptation Plan (AP)	The document or structured set of actions developed in Phase 3 to address prioritised risks and opportunities.

- 4.6. Following the scope and readiness established in Phase 1, the CCRA is the starting point of Phase 2. Exposure screening and vulnerability considerations add detail where needed, while targeted risk review is reserved for significant or uncertain risks; these are linked steps, not separate assessment frameworks. The resulting priorities inform the Adaptation Plan in Phase 3, are acted on in Phase 4 and are revisited through Phase 5 monitoring. Figure 2.1 and Figure 4.1 show the overall cycle and the Phase 2 process respectively.

Figure 4.1 Phase 2 Process for understanding risks and opportunities



- 4.7. Stakeholder input should inform these steps throughout Phase 2; see “Ongoing Stakeholder Engagement and Validation” for further detail.

Developing and Reviewing Climate Change Risk Assessment

- 4.8. NHS boards should have a CCRA in place to identify and evaluate climate-related risks relevant to their organisation. For most NHS boards, the CCRA should act as the foundation for Phase 2.
- 4.9. The CCRA provides a structured mechanism to:
 - identify relevant climate hazards
 - describe potential impacts on assets, services and operations
 - record historic climate-related incidents where applicable
 - assess and prioritise risks using a consistent methodology
- 4.10. Subsequent steps in this phase should refine and build on the CCRA where necessary, rather than duplicate it unnecessarily.
- 4.11. When developing or reviewing the CCRA, NHS boards should ensure that:
 - relevant national and local climate projection data have been considered (for example UK Climate Projections (UKCPs), Met Office information) (see ref 2 and 17)
 - flood and coastal mapping and other hazard datasets are current (For example Scottish Environment Protection Agency (SEPA) data and NHS Scotland Climate Mapping Tool) (see ref 18)
 - the organisational scope is clearly defined, including sites, services, infrastructure and key dependencies
- 4.12. The nationally available CCRA and Adaptation Planning Tool (see Appendix D) may be used to support this process. The CCRA is distinct from the AP. The CCRA identifies and evaluates risks. The AP, addressed in Phase 3, sets out actions and implementation arrangements. Use of a common tool can promote consistency and comparability across NHS Scotland; however, NHS boards may adopt alternative methodologies where these provide an equivalent level of robustness and transparency.
- 4.13. Where estate-related climate risks are being assessed, NHS boards should ensure alignment with relevant estate resilience guidance, including Health Building Note (HBN) 00-07 Planning for a Resilient Healthcare Estate, which provides detailed consideration of site-wide and infrastructure risks, including flooding and heat impact.
- 4.14. NHS boards should keep the CCRA under review and update it where appropriate, particularly where:
 - climate projection data or flood mapping are updated

- significant estate or service changes occur
- material climate-related incidents are experienced
- organisational risk management cycles require refresh

Identifying Asset and Service Exposure (Exposure Screening)

- 4.15. Where the CCRA identifies a relevant hazard but does not provide sufficient detail on which assets, services or dependencies may be affected, NHS boards should undertake proportionate exposure screening to determine whether specific infrastructure or services may be exposed.
- 4.16. Exposure screening is a high-level, desk-based activity used to identify potential exposure. It should normally be undertaken in relation to a relevant climate hazard identified through the CCRA, while taking account of the assets, services and dependencies that may be affected. It does not replace formal technical risk assessments required for planning or capital development. It is intended to help NHS boards determine whether further analysis is required in relation to particular assets, services or dependencies.
- 4.17. NHS boards may find it helpful to use a simple exposure screening template to record whether assets, services or dependencies may be affected by a relevant climate hazard. An illustrative template is provided in Appendix B .
- 4.18. Screening should consider, as appropriate:
- the geographical location of facilities in relation to flood risk areas, coastal zones or other mapped hazards
 - the siting of critical plant, equipment and utilities
 - building characteristics that may influence overheating or storm vulnerability
 - dependence on external infrastructure, including energy, water, digital connectivity and transport networks
 - services reliant on continuous environmental control or uninterrupted access
 - historical climate-related incidents affecting assets or services
- 4.19. Where estate-related risks are being screened, NHS boards should ensure alignment with relevant technical resilience guidance, including HBN 00-07 Planning for a Resilient Healthcare Estate and applicable Scottish Health Technical Memoranda (SHTMs) relating to critical engineering systems.

- 4.20. Where screening identifies no material exposure for a particular hazard, no further asset- or service-level analysis may be required at that stage. Where potential exposure is identified, NHS boards should proceed to vulnerability considerations and, where necessary, targeted risk review.

Refining Risk Through Vulnerability Considerations

- 4.21. Where exposure has been identified, NHS boards should refine their understanding of risk by considering relevant vulnerability factors.
- 4.22. Exposure screening helps identify what may be affected by a climate hazard. Vulnerability considerations help determine how severely an asset, service or population may be affected, and how well the organisation is able to anticipate, respond to and recover from the impact.
- 4.23. In line with recognised climate risk assessment practice, vulnerability reflects the interaction between:
- exposure - whether the asset, service or population is likely to experience the hazard
 - sensitivity - how severely it may be affected if exposed
 - adaptive Capacity - the ability to anticipate, cope with, respond to and recover from impacts
- 4.24. Exposure is established through the screening described in the previous section. Sensitivity and adaptive capacity help NHS boards understand the significance of the risk and support proportionate prioritisation.
- 4.25. When considering sensitivity, as a minimum NHS boards should reflect on:
- the criticality of the service affected
 - the presence of clinically vulnerable patients
 - dependence on continuous utilities or digital systems
 - the potential scale and duration of disruption
- 4.26. When considering adaptive capacity, as a minimum NHS boards should consider:
- existing resilience measures and controls
 - emergency preparedness and business continuity arrangements
 - redundancy in infrastructure and systems
 - staff awareness and training
 - partnership and mutual aid arrangements.

- 4.27. In many cases, these factors may already be partially reflected within the CCRA. This section does not require a separate vulnerability assessment unless additional analytical depth is necessary to support prioritisation, significant investment decisions or service redesign.
- 4.28. The purpose of this step is to support proportionate risk prioritisation and determine where more detailed review is required.

Targeted Risk Review (where required)

- 4.29. Where exposure screening and vulnerability considerations indicate elevated, uncertain or potentially significant risk to specific assets, services or dependencies, NHS boards should undertake targeted risk review to better understand the implications for service continuity, infrastructure resilience and operational delivery.
- 4.30. Targeted risk review is not required in every case. It should be undertaken only where earlier steps indicate that further understanding is needed to support prioritisation, planning or decision-making.
- 4.31. A targeted risk review provides a more detailed examination of identified risks. It is intended to build on the findings of the CCRA, exposure screening and vulnerability considerations, rather than replace them. It is not intended to replace statutory risk assessments, specialist engineering studies or technical assessments where these are required.
- 4.32. Targeted review should be proportionate and focused on assets, services or dependencies identified as potentially vulnerable.
- 4.33. A targeted review may include:
- examination of site layout and topography
 - location and protection of critical plant, equipment and utilities
 - review of drainage, water ingress pathways or surface water management
 - assessment of overheating risk in clinically sensitive spaces
 - review of dependency on external infrastructure and access routes
 - analysis of service interdependencies and continuity implications
- 4.34. Where risks relate to estate infrastructure or engineering systems, NHS boards should ensure alignment with relevant technical guidance, including HBN 00-07 Planning for a Resilient Healthcare Estate, applicable SHTMs relating to electrical, water, ventilation and other critical systems and relevant flood risk or environment planning requirements.

- 4.35. Where required, specialist input, for example from flood engineers, building services engineers, or thermal modelling specialists, may be sought to inform decision-making. Such assessments should use data appropriate to the location and hazard, including relevant future climate scenarios, in line with applicable technical guidance.

Worked Example: Flooding Risk Across Acute Sites

CCRA: The NHS board's CCRA identifies flooding as a significant climate-related risk affecting service continuity, infrastructure and access to care.

Exposure screening: Using the NHS Scotland Climate Mapping Tool and other relevant local data, the NHS board undertakes a proportionate review of flood exposure across all acute sites. This identifies sites potentially affected by river, surface water or coastal flooding, and highlights key assets and services that may be exposed.

Vulnerability considerations: The NHS board then considers factors that may increase vulnerability, including the location of critical plant and equipment, reliance on uninterrupted power or digital systems, access and egress routes, service criticality, the presence of vulnerable patients, and the organisation's existing capacity to respond to and recover from flooding incidents.

Targeted risk review: Where earlier steps indicate elevated or uncertain risk, the NHS board undertakes more detailed site-specific review. This may include flood risk assessment, review of drainage and water ingress pathways, analysis of the location of critical infrastructure, and the consideration of operational implications for priority services.

Output: The NHS board confirms which sites and services are most at risk from flooding and identifies where further action is needed. These findings then inform Phase 3, including prioritisation of adaptation measures such as flood protection, relocation of vulnerable equipment, contingency arrangements, or service continuity actions.

Identifying Vulnerable Populations and Critical Services

- 4.36. NHS boards must consider whether identified climate hazards and associated risks may disproportionately affect certain population groups or critical services.
- 4.37. Climate-related impacts are not distributed evenly. Some individuals and services may be more susceptible to harm or disruption due to underlying vulnerability or service criticality.
- 4.38. This consideration should inform both risk prioritisation and the later design of adaptation actions.

- 4.39. NHS boards should consider, as appropriate:
- older people and those with long-term health conditions
 - individuals reliant on powered medical equipment or regular clinical intervention
 - socioeconomically disadvantaged communities
 - rural and remote populations with limited service access
 - patients receiving critical or time-sensitive care
- 4.40. In addition, NHS boards should identify services that are essential to patient safety and system resilience, including:
- emergency and urgent care
 - intensive and high-dependency care
 - mental health crisis services
 - community and outreach services supporting vulnerable groups
- 4.41. Where climate risks intersect with vulnerable populations or critical services, this should inform prioritisation within Phase 3.
- 4.42. Consideration of population and service vulnerability supports equitable adaptation planning and aligns climate resilience with wider public health objectives.

Identifying Opportunities

- 4.43. In addition to identifying and prioritising climate-related risks, NHS boards should consider whether areas of identified vulnerability present opportunities for wider organisational benefit. Identifying opportunities should not be treated as a separate exercise from risk assessment. In many cases, opportunities emerge directly from understanding where resilience improvements may also deliver wider operational, health or sustainability benefits.
- 4.44. As risks are analysed through exposure screening and vulnerability considerations, NHS boards should consider whether improving resilience could also:
- enhance patient safety, comfort and recovery
 - improve service continuity and operational performance
 - reduce long-term operational or maintenance costs
 - improve staff wellbeing
 - support service redesign or transformation
 - strengthen alignment with NHS Scotland Sustainability and net zero targets

- 4.45. Opportunities may arise from changes to estate design, service delivery models, infrastructure upgrades or behavioural initiatives.
- 4.46. At this stage, NHS boards are not required to define specific adaptation actions. Rather, strategic opportunity areas should be identified and documented to inform option development and appraisal in Phase 3.

Example: Opportunity Log (Illustrative)

- 4.47. NHS board may use a structured approach to record identified opportunity areas (see Table 4.2).

Table 4.2 - Opportunity Log

Risk Area Identified	Potential Wider Benefit	Strategic Alignment	Indicative Timeframe	Notes for Planning
Overheating in patient wards	Improved patient comfort and recovery; reduced cooling demand	Estates Strategy/ Net Zero Plan	Medium term	Consider passive design improvements
Flood exposure affecting plant rooms	Improved infrastructure resilience; reduced service disruption	Capital Investment Planning	Long term	Review plant relocation options
Travel disruption affecting outpatient access	Improved service accessibility; reduced emissions	Service Transformation/ Sustainability	Short-Medium term	Explore hybrid service models

- 4.48. This table is illustrative. NHS boards may adapt the format to align with local governance and reporting arrangements.

Ongoing Stakeholder Engagement and Validation

- 4.49. Stakeholder engagement should support all stages of Phase 2, from the review of the CCRA through to exposure screening, vulnerability considerations and targeted risk review.

- 4.50. Engagement should involve the governance and stakeholder arrangements established in Phase 1. Additional specialist input may be required where specific hazards or service impacts are identified. Engagement should help validate both technical and operational relevance.
- 4.51. Stakeholder engagement should support:
- confirmation of relevant hazards and exposure
 - assessment of service criticality and vulnerability
 - identification of infrastructure dependencies
 - recognition of strategic opportunity areas
 - validation of prioritised risks and opportunity areas
- 4.52. Engagement should be proportionate and aligned with existing organisational governance and risk management structures.
- 4.53. NHS boards should consider cascading and system-level risks, including risks that originate outside the NHS but may affect NHS services, assets, workforce or patients. Examples may include disruption to transport networks affecting staff and patient access, utility failures affecting clinical operations, supply chain disruption affecting medicines or equipment, or pressures on partner services increasing demand on NHS services. These risks should be considered through the CCRA, exposure screening and stakeholder engagement, and validated with relevant partners where appropriate.

5. Phase 3 Preparing for Action: Developing an Adaptation Plan

- 5.1. The purpose of Phase 3 is to enable NHS boards to move from understanding climate risks and opportunities to defining clear, prioritised and deliverable adaptation actions. This phase focuses on translating the outputs of Phase 2 into a structured Adaptation Plan (AP) that sets out what action will be taken, by whom, and over what timescale.
- 5.2. Phase 3 ensures that adaptation planning is proportionate to risk, aligned with corporate priorities, and integrated with existing governance, estates planning, service delivery and investment processes. The outputs of this phase provide the basis for implementation and embedding in Phase 4.
- 5.3. Figure 5.1 illustrates how the main steps in Phase 3 fit together, from reviewing existing actions through to formalising the AP and integrating it with governance and monitoring arrangements.

Figure 5.1 Phase 3 process for developing the AP



- 5.4. The purpose of this phase is not to create a standalone planning process, but to translate prioritised risks into practical actions that can be integrated with existing organisational arrangements.

Reviewing Existing Adaptation Actions

- 5.5. Where adaptation measures have previously been identified within the Climate Change Risk Assessment (CCRA) of the NHS Scotland CCRA and Adaptation Planning Tool, or other local planning documents, NHS boards should review these actions before developing new measures.
- 5.6. This review should ensure that existing actions:
- remain aligned with the prioritised risks identified in Phase 2
 - adequately address identified exposure and vulnerability
 - reflect current estate configuration and service delivery models
 - remain feasible within current governance and resource constraints
- 5.7. Existing actions may be:
- confirmed and carried forward
 - revised or expanded
 - reprioritised based on updated risk understanding
 - consolidated where duplication exists
 - removed where no longer relevant
- 5.8. Where no formal adaptation actions are currently documented, NHS boards should proceed to define objectives and options in the following sections.
- 5.9. This step supports continuity, avoids duplication of effort and ensures that adaptation planning builds on existing work.

Setting Adaptation Objectives

- 5.10. Adaptation objectives should be derived directly from the prioritised risks identified in Phase 2.
- 5.11. Objectives provide a clear statement of the outcomes the NHS board intends to achieve in managing climate-related risks. They should focus on reducing vulnerability, protecting patient and staff safety, and strengthening service continuity.

5.12. Adaptation objectives should:

- be clearly linked to one or more prioritised climate risks
- be outcome-focused rather than action-specific
- be proportionate to the level of risk identified
- support protection of critical infrastructure and essential services
- consider impacts on vulnerable populations

5.13. Examples of adaptation objectives include:

- reduce the risk of service disruption from flooding at priority sites
- improve thermal comfort and patient safety in high-risk clinical areas
- strengthen resilience of critical utilities and digital systems to extreme weather
- ensure all new capital projects incorporate climate-resilient design principles

5.14. Adaptation objectives provide the framework for identifying and assessing specific measures in the following section. Where existing objectives have already been defined within the CCRA or adaptation planning documentation, these should be reviewed and refined in line with updated risk evidence.

Identifying and Assessing Adaptation Options

5.15. Once adaptation objectives have been defined, NHS boards should identify potential adaptation options using a whole-system approach. NHS boards should focus on identifying options that are proportionate, feasible and capable of reducing the relevant risk or vulnerability in practice.

5.16. Where adaptation measures are already recorded within the CCRA or associated planning tools, these should be reviewed and refined rather than duplicated.

Considering Options Across Health System Domains

5.17. To support a comprehensive and integrated approach, NHS boards should consider adaptation options across key operational domains of a climate-resilient and low carbon health system.

5.18. This domain-based structure aligns with recognised health system resilience frameworks, including the World Health Organization's (WHO's) climate-resilient health system components, while reflecting the governance and operational context of NHS Scotland (see ref 10).

5.19. Adaptation options may be identified across the following domains.

Governance and Leadership

- 5.20. Options in this component focus on strengthening organisational arrangements that enable effective adaptation.
- 5.21. Examples include:
- establishing or strengthening NHS board-level oversight of climate adaptation
 - embedding climate risk into corporate risk registers and assurance processes
 - integrating adaptation considerations into policies, strategies and decision-making frameworks
 - clarifying roles and responsibilities for adaptation across directorates

Workforce

- 5.22. This component addresses the capacity and capability of the workforce to operate safely and effectively under future climate conditions.
- 5.23. Examples include:
- training and awareness-raising on climate risks and adaptation
 - adjustments to working practices during extreme weather events
 - measures to protect staff wellbeing during heat events or service disruption
 - ensuring workforce plans consider climate-related impacts on availability and skills

Climate Change Risk Assessment and Monitoring

- 5.24. Options under this component support improved understanding and ongoing monitoring of climate risks.
- 5.25. Examples include:
- regular review and updating of CCRAs
 - improved monitoring of indoor temperatures, flooding incidents or service disruption
 - use of early warning systems and alerts to support operational decision-making
 - integration of climate risk data into asset and service management systems

Infrastructure and Estates

- 5.26. This component focuses on physical and technical measures to protect healthcare assets and services.

- 5.27. Examples include:
- flood protection, drainage improvements and site resilience measures
 - reducing overheating through building fabric improvements, shading and ventilation
 - strengthening energy resilience and backup power arrangements
 - enhancement of energy, water and digital system resilience
- 5.28. Where estate interventions are proposed, NHS boards should ensure alignment with relevant technical guidance, including Scottish Health Technical Note (SHTN) 02-01 Sustainable Design and Construction (SDaC) and Health Building Note (HBN) 00-07 Planning for a Resilient Healthcare Estate, as well as applicable Scottish Health Technical Memoranda (SHTMs) for critical engineering systems. For example, where a proposed estate intervention includes electrified heating, NHS boards should consider the associated electrical demand and the capacity and resilience of incoming supplies, with reference to SHTM 06-01 Electrical services and supply and distribution.

Service Delivery and Care pathways

- 5.29. Adaptation options in this area focus on maintaining safe, effective care during climate-related disruptions.
- 5.30. Examples include:
- revising clinical pathways to maintain continuity during extreme weather
 - expanding remote or flexible service delivery where appropriate
 - strengthening surge capacity planning for climate-related demand
 - ensuring clinical guidance accounts for climate-related health risks

Supply Chains and Procurement

- 5.31. This area focuses on ensuring continuity and resilience of critical supplies, services and procurement processes during climate-related disruptions.
- 5.32. Examples include:
- identification of climate-sensitive supply dependencies
 - incorporation of climate resilience considerations within procurement processes

Emergency Preparedness and Response

- 5.33. This component aligns adaptation with existing emergency planning and resilience arrangements.

5.34. Examples include:

- integrating climate scenarios into emergency planning and exercises
- reviewing business continuity plans for climate-related hazards
- strengthening coordination with Local Resilience Partnerships and emergency services
- improving communication protocols during extreme weather events

Environmental Sustainability and Carbon Considerations

5.35. This domain-based consideration ensures that adaptation strengthens system resilience while remaining aligned with low-carbon health system principles.

5.36. Examples include:

- measures that enhance resilience while reducing energy demand, such as appropriate external shading or reducing avoidable internal heat gains
- nature-based or passive design approaches where appropriate
- avoidance of maladaptation, including solutions that increase long-term emissions or operational vulnerability

Financing and Investment

5.37. Options in this component ensure that adaptation is supported by appropriate financial planning.

5.38. Examples include:

- considering whole-life costs and avoided future costs when appraising options
- incorporating climate resilience into capital investment decisions
- aligning adaptation actions with planned maintenance and refurbishment programmes
- exploring funding opportunities and shared investment with partners

Community and Partnership Working

5.39. Adaptation options should recognise the interdependence between NHS services, communities and partner organisations.

5.40. Examples include:

- working with local authorities and communities to address shared climate risks
- supporting community resilience initiatives that reduce health system pressures
- engaging patients and communities in shaping adaptation priorities
- strengthening coordination across NHS boards

- 5.41. NHS boards do not need to identify options in every domain in every case; rather, the relevant domains should be considered in light of the risks, services, assets and dependencies identified in Phase 2.

Assessing and Appraising Adaptation Options

- 5.42. Identified adaptation options should be assessed proportionately to support informed and transparent decision-making.
- 5.43. Assessment should consider multiple criteria to ensure that selected measures effectively reduce risk while aligning with wider organisational objectives.
- 5.44. Where adaptation measures involve capital investment or estate modification, NHS boards should consider whole-life carbon implications and sustainable design requirements in accordance with SHTN 02-01 (see ref 11).
- 5.45. NHS boards may use a structured decision matrix to support consistent appraisal of options. The level of detail should reflect the scale and complexity of the proposed measure.
- 5.46. Assessment criteria may include:
- effectiveness in reducing the identified risk
 - impact on patient safety and service continuity
 - technical and operational feasibility
 - financial implications and lifecycle cost
 - workforce impact
 - equity and impact on vulnerable populations
 - carbon and sustainability implications
 - potential co-benefits
 - risk of maladaptation

Example: Adaptation Option Appraisal Matrix (Illustrative)

Table 5.1 Example: Adaptation Option Appraisal Matrix (Illustrative)

Identified Risk	Adaptation Option	Risk Reduction Effectiveness	Feasibility	Patient and Service Impact	Equity Considerations	Carbon Impact	Cost/ Value for Money	Co-benefits	Overall Priority
Overheating in clinical areas affecting patient safety	Passive cooling retrofit	High	Medium	High positive	Benefits vulnerable patients	Positive	Medium capital	Energy savings	High
Extreme-weather power loss disrupting critical services	Backup generator upgrade	High	High	Protects critical services	Neutral	Neutral/negative	High capital	Service resilience	High

Identified Risk	Adaptation Option	Risk Reduction Effectiveness	Feasibility	Patient and Service Impact	Equity Considerations	Carbon Impact	Cost/ Value for Money	Co-benefits	Overall Priority
Severe-weather travel disruption limiting outpatient access	Telehealth expansion	Medium	High	Improves continuity	Improves rural access	Positive	Moderate	Access and emissions	Medium-High

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- 5.47. NHS boards may use qualitative scoring, for example High, Medium or Low, or numerical scoring where appropriate. Weighting of criteria may be considered for major investment decisions.
- 5.48. The level of appraisal detail should be proportionate to the scale, complexity and cost of the proposed action.
- 5.49. An illustrative worked example showing how a priority risk may be translated into adaptation objective, options and actions is provided in Appendix C.

Categorising Adaptation Actions for Delivery

- 5.50. Following appraisal of adaptation options, NHS boards should group actions in a way that supports delivery, sequencing and integration with existing governance and planning cycles.
- 5.51. Actions may differ in urgency, complexity, cost, dependency and delivery timescale. Grouping them in this way can help NHS boards plan implementation without implying that longer-term or more complex actions are of lower importance.
- 5.52. NHS boards may find it helpful to categorise actions as follows.

Near-term Operational Actions

- 5.53. Actions addressing immediate or higher-priority risks that can be progressed through operational, procedural or relatively low-complexity measures. These may include:
- operational adjustments
 - procedural updates
 - low-cost resilience measures
 - monitoring improvements

Planned Enhancement Actions

- 5.54. Actions requiring further planning, coordination or moderate investment, including:
- targeted infrastructure modifications
 - Service Pathway adjustments
 - workforce resilience initiatives
 - digital or contingency upgrades

Strategic and Capital-linked Actions

- 5.55. Longer-term actions linked to major estate renewal, infrastructure replacement or service transformation programmes. These may include:
- significant estate redesign
 - relocation of vulnerable infrastructure
 - large-scale system upgrades
- 5.56. These categories are intended to support delivery planning and sequencing. They do not imply that strategic or longer-term actions are of lower priority than near-term actions.
- 5.57. When categorising actions, NHS boards should consider:
- risk severity and urgency
 - dependencies between actions
 - resource implications
 - alignment with capital and operational planning cycles
 - opportunities to integrate with planned sustainability initiatives
- 5.58. Table 5.2 provides an illustrative summary of how adaptation actions may be grouped for delivery.

Table 5.2 Illustrative grouping of adaptation actions for delivery

Action category	Typical characteristics	Illustrative examples
Near-term operational actions	Shorter timescale, lower complexity, often operational or procedural.	Update heatwave or flood procedures; improve monitoring; revise continuity arrangements.
Planned enhancement actions	Moderate coordination or investment, may involve service or infrastructure improvements.	Improve shading or drainage; strengthen backup arrangements; update access planning.
Strategic and capital-linked actions	Longer-term, higher cost or linked to estate renewal, capital investment or service transformation	Relocate vulnerable plant; redesign estate elements; incorporate resilience into major capital works.

- 5.59. Where resources are constrained, NHS boards should sequence actions transparently, taking account of risk severity, service criticality, vulnerable populations, deliverability and opportunities to align with planned programmes of work. Low-cost or no-regret actions,

such as procedural updates, monitoring improvements or business continuity changes, may be progressed early while more complex or capital linked actions are incorporated into future investment, estate or service planning cycles.

Formalising the NHS board Adaptation Plan

- 5.60. Following appraisal and categorisation of adaptation actions, NHS boards should formalise these actions within a structured NHS board Adaptation Plan (AP).
- 5.61. The AP should consolidate the outputs of Phase 3 and provide a clear, accountable framework for delivery.
- 5.62. The plan should:
 - clearly link each action to identified climate risks and adaptation objectives
 - identify the relevant SNAP3 objectives and state how the Adaptation Plan supports them
 - reflect the agreed grouping of actions for delivery
 - assign lead responsibility for each action
 - identify indicative resource, workforce capacity and specialist support requirements for each action
 - include indicative timescales aligned with organisational planning cycles
 - identify dependencies and links to capital, estate or service programmes
 - define monitoring and reporting arrangements
- 5.63. Indicators and measures should be identified when adaptation actions are being defined. For each significant action, NHS boards should consider:
 - the intended outcome and a proportionate measure of progress or effectiveness
 - the scope of monitoring and any relevant threshold
 - the likely data source, reporting route
 - any triggers for review
- 5.64. The elements above provide a checklist for structuring the AP as a single, current overview of agreed adaptation actions and their progress. The NHS Scotland CCRA and Adaptation Planning Tool for Healthcare Assets (see Appendix D) may be used to record and track relevant asset-related actions; where actions are managed through other local systems, their status should be reflected in the AP.
- 5.65. Where an AP already exists, it should be reviewed and updated in line with the structured process described in this phase rather than replaced unnecessarily.

- 5.66. The NHS board AP should be embedded within existing governance and risk management frameworks to ensure that climate resilience is integrated into routine organisational planning.
- 5.67. The format of the AP may vary locally, provided that actions, responsibilities, timescales and monitoring arrangements are clearly recorded.

Integration with NHS Scotland Governance and Monitoring

- 5.68. As established in Phase 1, adaptation responsibilities should be reflected within existing governance, risk management and reporting structures wherever possible. The NHS board AP should therefore be integrated within existing governance mechanisms, assurance and estate management frameworks to ensure sustained oversight and accountability.
- 5.69. Adaptation should not be managed as a standalone initiative. Rather, actions should be embedded within established organisational structures, including:
- corporate risk management processes
 - NHS board reporting arrangements
 - capital investment and estate planning programmes
 - sustainability and net zero reporting frameworks
 - business continuity and emergency preparedness arrangements
- 5.70. This should help ensure that adaptation actions are visible within existing assurance and decision-making processes, rather than being managed separately.
- 5.71. Where adaptation actions relate to estate design, infrastructure or major capital works, NHS boards should ensure alignment with relevant technical guidance, including SHTN 02-01 and HBN 00-07.

Monitoring and Assurance

- 5.72. Clear governance oversight should be established for monitoring progress against adaptation actions. This may include periodic reporting to relevant committees or inclusion within corporate performance frameworks.

- 5.73. Monitoring arrangements should:
- track progress against defined actions and objectives
 - identify emerging risks or changes in context
 - capture lessons learned from climate-related incidents
 - support adjustment or reprioritisation where necessary
- 5.74. Adaptation monitoring should align, where appropriate, with:
- corporate performance reporting frameworks
 - estate and sustainability assurance mechanisms
- 5.75. The AP should be reviewed periodically and updated in alignment with:
- updates to the CCRA
 - organisational planning cycles
 - significant infrastructure or service changes
 - relevant national policy or climate data updates
- 5.76. Monitoring and review should support updating of actions over time as risks, evidence, organisational priorities and delivery progress change.

6. Phase 4 Implementation and Embedding Adaptation

- 6.1. The purpose of Phase 4 is to ensure that adaptation actions identified in the NHS board Adaptation Plan (AP) are translated into delivery and embedded within routine organisational processes. This phase focuses on moving from planning to implementation, ensuring that adaptation actions are resourced, governed, communicated and integrated into relevant operational, estate and service systems.
- 6.2. Implementation should not be treated as a separated or temporary workstream. Adaptation actions should be delivered through existing programmes, governance routes and business processes. This helps ensure that climate resilience becomes part of routine organisational decision-making rather than remaining dependent on individual projects or short-term initiatives.
- 6.3. Implementation may take place over different timescales. Some actions may be progressed through operational or procedural changes in the short term, while others may depend on longer-term investment, estate renewal, service redesign or partnership activity. The purpose of this phase is therefore not only to support delivery, but to ensure that adaptation is embedded in a way that can be sustained over time.

Mobilising Resources and Capacity

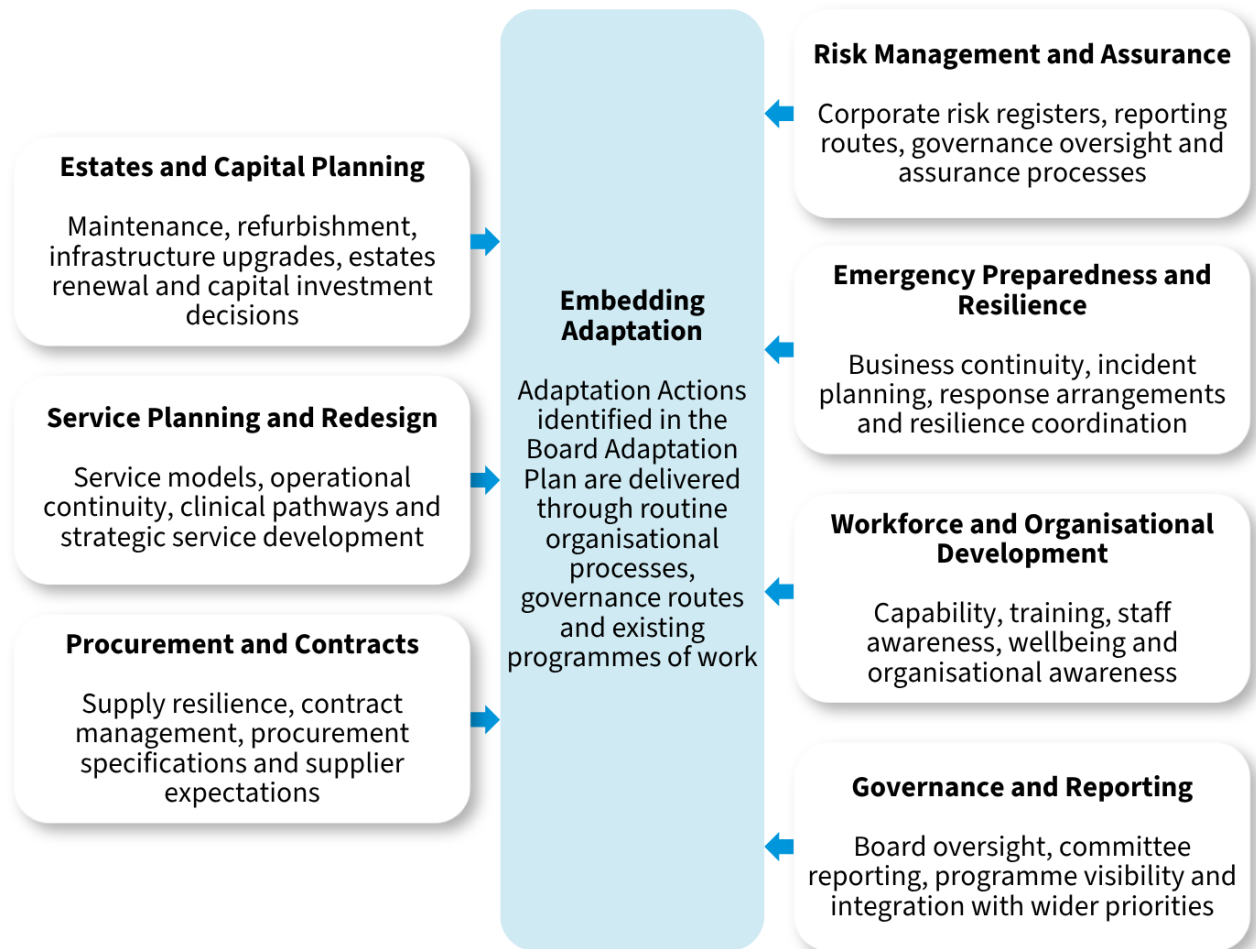
- 6.4. Implementation of adaptation actions will require NHS boards to consider the resources, capability and delivery arrangements needed to support progress. These requirements will vary according to the scale, complexity and timing of the actions identified in Phase 3.
- 6.5. NHS boards should consider, as appropriate:
- capital funding requirements for infrastructure or estate-related actions
 - opportunities to align adaptation actions with planned maintenance, refurbishment or capital investment programmes
 - external funding or grant opportunities where available
 - shared procurement or collaborative approaches where these may improve efficiency or consistency
 - workforce capability and capacity to support delivery
 - specialist input required for technical, engineering, clinical or service redesign actions

- 6.6. In many cases, adaptation actions will be more achievable where they are aligned with existing investment cycles, planned programmes of work or wider organisational priorities. NHS boards should therefore seek to integrate adaptation resource and capacity needs into existing business planning and investment processes wherever possible.
- 6.7. Where resources are constrained, NHS boards should prioritise implementation in line with the significance of risk, service criticality and opportunities to align with existing programmes of work.

Embedding into Business Processes

- 6.8. Building on the principle set out earlier in this guidance that adaptation should not be managed as a standalone initiative, NHS boards should embed adaptation within the business processes through which they plan, govern, deliver and assure services. Embedding adaptation in this way helps avoid reliance on standalone initiatives and supports continuity over time.
- 6.9. Adaptation actions should be integrated, as appropriate, into:
- estate management, maintenance and capital planning processes
 - service planning and redesign processes
 - procurement and contract management arrangements
 - corporate risk management and assurance systems
 - emergency preparedness, resilience and response (EPRR) arrangements
 - workforce planning, organisational development and staff training processes
 - sustainability and net zero planning where relevant
- 6.10. Embedding adaptation into these processes should help ensure that climate resilience is considered routinely in decision-making, project development and operational delivery within NHS boards, where the board is working in collaboration with other organisations. It should also support clearer accountability and reduce the risk that adaptation remains disconnected from core organisational activity.
- 6.11. Where possible, NHS boards should make use of existing governance, reporting and assurance routes rather than creating separate implementation structures. This should help ensure that adaptation actions are visible within routine management and decision-making processes, and that progress can be monitored alongside other organisational priorities.
- 6.12. The following example illustrates how adaptation actions may be embedded through existing organisational processes and governance arrangements.

Figure 6.1 Embedding adaptation through existing organisational processes



Embedding Adaptation into Resilience and Recovery Arrangements

NHS boards should ensure that climate adaptation actions are reflected in relevant resilience, business continuity, emergency preparedness, operational recovery and assurance arrangements. This may include reviewing business continuity, major incident and recovery plans against current and projected climate risks; considering climate scenarios in emergency planning, exercising, training and lessons-identified activity; and strengthening warning, communication, escalation and situational awareness arrangements during climate-related incidents.

Recovery activity should also consider longer-term adaptation opportunities. Where services, facilities or infrastructure are being restored following disruption, NHS boards should consider whether recovery provides opportunities to reduce future vulnerability, improve resilience, support sustainable replacement or refurbishment, and embed learning into estate, infrastructure, digital, supply chain, workforce and service planning.

Delivering Adaptation Actions

- 6.13. Once adaptation actions have been identified and incorporated into the NHS board AP, NHS boards should ensure that they are progressed through appropriate delivery arrangements. Delivery may take different forms depending on the nature of the action. Some actions may be implemented through operational or procedural changes, while others may require formal projects, estate interventions, service redesign or partnership activity.
- 6.14. NHS boards should ensure that adaptation actions are delivered through arrangements that are proportionate to their scale, complexity and risk significance. This may include:
- assigning clear lead responsibility for each action
 - confirming governance oversight and reporting routes
 - defining delivery timescales and milestones
 - identifying dependencies, assumptions and implementation risks
 - aligning actions with planned programmes of work where appropriate
 - considering impacts on patient safety, service continuity and operational resilience during delivery
- 6.15. Where actions require formal project or programme management, NHS boards should make use of existing project governance and delivery structures rather than establishing parallel arrangements. This is particularly important where actions involve capital investment, infrastructure changes, digital systems, service reconfiguration or cross-functional delivery.
- 6.16. Where adaptation actions involve building fabric, engineering systems, utilities, estate renewal or major capital works, NHS boards should ensure alignment with relevant technical guidance, including Scottish Health Technical Note (SHTN) 02-01 Sustainable Design and Construction (SDaC), Health Building Note (HBN) 00-07 Planning for a Resilient Healthcare Estate, and applicable Scottish Health Technical Memoranda (SHTMs) for critical engineering systems (see ref 11 and 12).
- 6.17. During implementation, NHS boards must remain alert to the risk of maladaptation. Actions that reduce one form of climate risk should not create new operational vulnerabilities, undermine wider resilience, or lead to unintended increase in emissions, cost or service disruption. Where appropriate, NHS boards should also consider opportunities to secure co-benefits, including improved patient experience, staff wellbeing, environmental sustainability and long-term value for money.
- 6.18. The purpose of this section is not to prescribe a single delivery model, but to ensure that adaptation actions are progressed in a structured, accountable and proportionate way.

Example: Delivering an overheating resilience action

An NHS board may identify overheating in clinically sensitive areas as a priority risk, particularly where wards, waiting areas, treatment spaces, or other areas used by vulnerable patients are exposed to high internal temperatures during periods of extreme heat. Delivery may involve linking adaptation actions to planned maintenance, refurbishment or capital works, such as installing external shading, improving ventilation, increasing temperature monitoring, reviewing operational procedures during heat events, and, where appropriate, using landscape or nature-based measures, such as tree planting or green infrastructure to provide local cooling.

Where proposed refurbishment or capital works are likely to affect thermal performance, the project team should assess overheating risk and proposed measures through appropriate modelling, using weather files selected for the location and purpose of the assessment, including relevant future climate scenarios, in line with SHTN 02-01 and its referenced modelling guidance.

The aim should be to support safe and appropriate internal temperatures, protect patient and staff wellbeing, and maintain continuity of care during hot weather (see ref 1). Responsibilities, timescales and monitoring arrangements should be recorded in the AP and progressed through existing estate, service and governance routes.

Communicating Adaptation

- 6.19. Effective communication supports implementation by building understanding, maintaining engagement and reinforcing the relevance of adaptation to different audiences across the organisation. Communication should help ensure that adaptation is understood as part of patient safety, service continuity, resilience and long-term planning, rather than as a standalone environmental issue.
- 6.20. NHS boards should communicate adaptation in a way that is proportionate to the nature of the actions being delivered and the audiences affected. This may include communication with:
- NHS board members and senior leaders
 - clinical and operational teams
 - estates, facilities and project delivery teams
 - staff more broadly
 - partner organisations and external stakeholders
 - patients and communities, where relevant

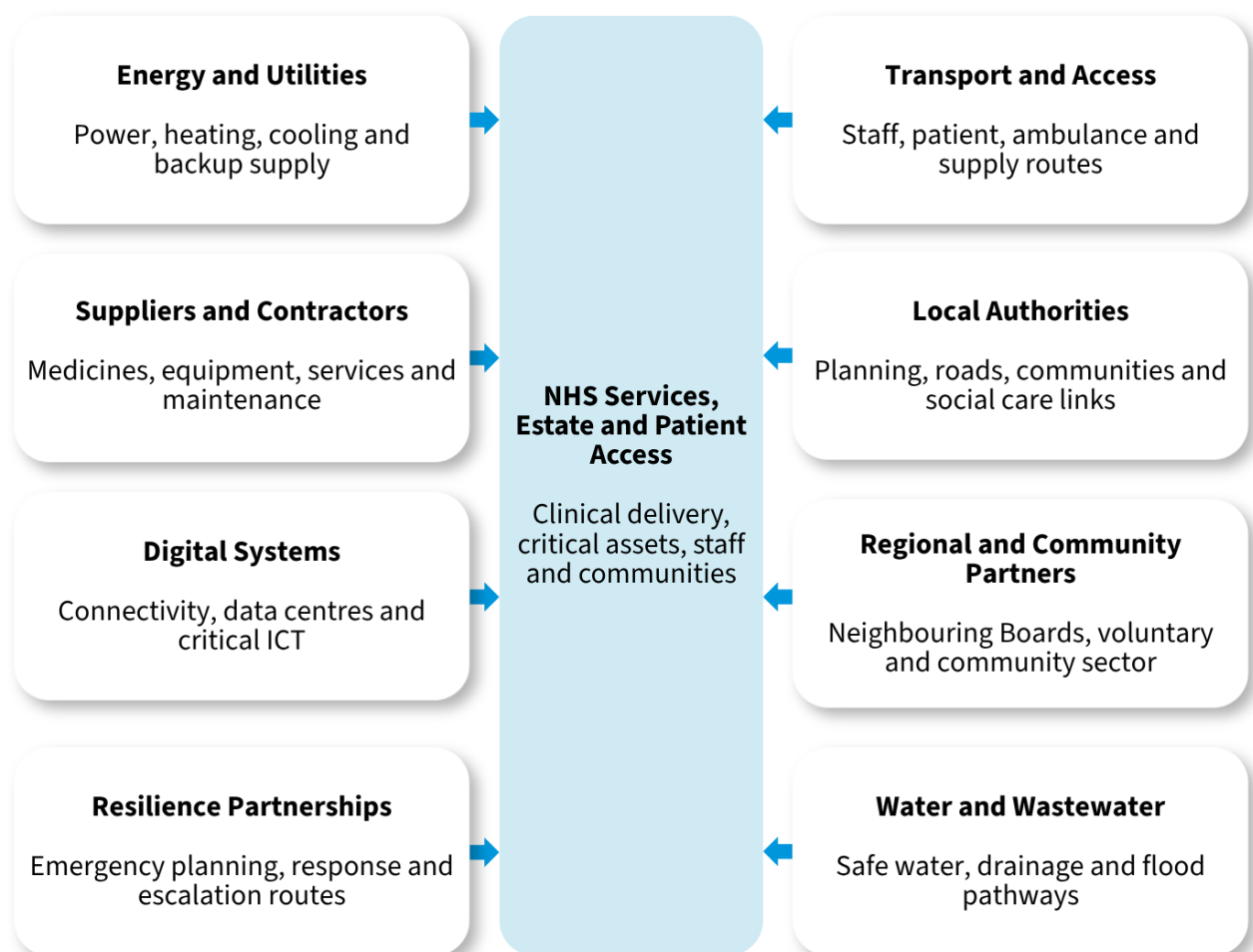
- 6.21. Communication should help explain:
- why adaptation action is being taken
 - how it supports patient safety, service continuity and organisational resilience
 - what changes are expected in practice
 - who is responsible for delivery and oversight
 - how progress will be monitored and reviewed
- 6.22. Communication should be aligned with existing governance, reporting and engagement routes wherever possible. For example, NHS boards may use NHS board updates, committee reports, project briefings, staff communications, clinical briefings or public-facing messages where appropriate.
- 6.23. When adaptation actions affect service delivery, access, patient experience or local communities, communication should be planned early and coordinated with relevant operational, clinical, communications and engagement teams. This helps ensure that messages are clear, timely and appropriate for the audiences affected.

Working with Partners

- 6.24. Building on the dependencies and interdependencies identified through Phase 2, many adaptation actions depend on effective collaboration beyond the NHS board itself. Climate risks and their consequences often involve interdependencies with local infrastructure, public services, communities and partner organisations. Working with partners can therefore support a more coordinated and effective response to shared climate risks.
- 6.25. NHS boards should identify where adaptation actions involve shared risks, dependencies or delivery responsibilities. Depending on local context, relevant partners may include:
- Local Resilience Partnerships
 - Local authorities
 - Regional Adaptation Partnerships or Climate Ready Regions, where established
 - Public health partners
 - infrastructure and utility providers, including Scottish Water, Scottish Environment Protection Agency (SEPA) and transport bodies;
 - community and voluntary organisations
 - neighbouring NHS boards and regional partners
 - key suppliers, contractors or service partners

- 6.26. Where Regional Adaptation Partnerships or Climate Ready Regions are established, NHS boards should consider how their adaptation activity can align with wider regional risk assessment, priority setting and resilience planning.
- 6.27. Where relevant partnership arrangements or shared risk awareness are not yet well established, NHS boards should proactively engage appropriate partners and share relevant climate risk information. This will support earlier recognition of risks that extend beyond NHS boundaries and enable coordinated consideration of appropriate mitigation, resilience or adaptation actions.
- 6.28. Figure 6.2 illustrates examples of external dependencies that may affect NHS service resilience during climate-related events. It highlights the adaptation actions may depend on infrastructure, services and partner organisations beyond the direct control of the NHS board, and that these dependencies should be considered when clarifying roles, information-sharing arrangements and escalation routes.

Figure 6.2 Examples of external dependencies affecting NHS service resilience



- 6.29. Partnership working may support:
- better understanding of shared climate risks and interdependencies
 - alignment of resilience and adaptation measures across system
 - coordinated emergency planning and response
 - improved management of infrastructure, access and service dependencies
 - opportunities for joint investment, shared learning or coordinated delivery
- 6.30. NHS boards should make use of existing partnership arrangements wherever possible, rather than creating new structures unnecessarily. This may include local resilience arrangements, regional planning groups, public health networks, estate or infrastructure forums, and other local or national coordination mechanisms.
- 6.31. Where adaptation actions depend on external partners, NHS boards should clarify roles, dependencies, information-sharing arrangements and escalation routes. This helps ensure that shared risks are understood and that adaptation actions remain deliverable across organisational boundaries.

Example: Where flood risk affects a key access route to an acute site, the NHS board may need to work with the local authority, transport providers, Local Resilience Partnership and neighbouring services to agree information-sharing arrangements, trigger points, alternative access routes, escalation routes and communications with staff, patients and communities. This helps ensure that a risk originating outside NHS estate boundaries is managed in a way that supports continuity of care.

Integrating Adaptation with Regional and Strategic Planning

- 6.32. Some adaptation actions will need to be considered beyond the level of individual sites or services. Regional service planning, capital investment decisions, infrastructure dependencies and wider strategic change programmes may all affect how adaptation is implemented in practice.

- 6.33. NHS boards should consider whether adaptation actions need to be reflected within:
- regional planning arrangements
 - strategic service redesign programmes
 - cross-NHS board collaboration
 - major estate strategies and infrastructure programmes
 - wider place-based or system-level resilience initiatives
 - regional Adaptation Partnerships or Climate Ready Regions, where established
- 6.34. This is particularly important where climate risks affect service interdependencies, patient access, critical infrastructure or the long-term configuration of services. Considering adaptation within broader strategic planning helps ensure that actions taken locally are aligned with wider organisational and system change.
- 6.35. Adaptation should also be considered where strategic or regional decisions may affect future exposure or vulnerability. For example, changes to service location, estate configuration, infrastructure investment or models of care may create opportunities to reduce climate risk but may also increase risk if future climate conditions are not considered.
- 6.36. Where relevant, NHS boards should seek to align adaptation activity with regional risk assessment, priority setting, service planning and investment decisions. This can help support consistency, avoid duplication, and ensure that climate resilience is considered alongside other long-term planning priorities.
- 6.37. Before moving to Phase 5, NHS boards should ensure that adaptation actions are sufficiently embedded for delivery and monitoring. Table 6.1 provides a summary of key implementation considerations.

Table 6.1 Key implementation considerations

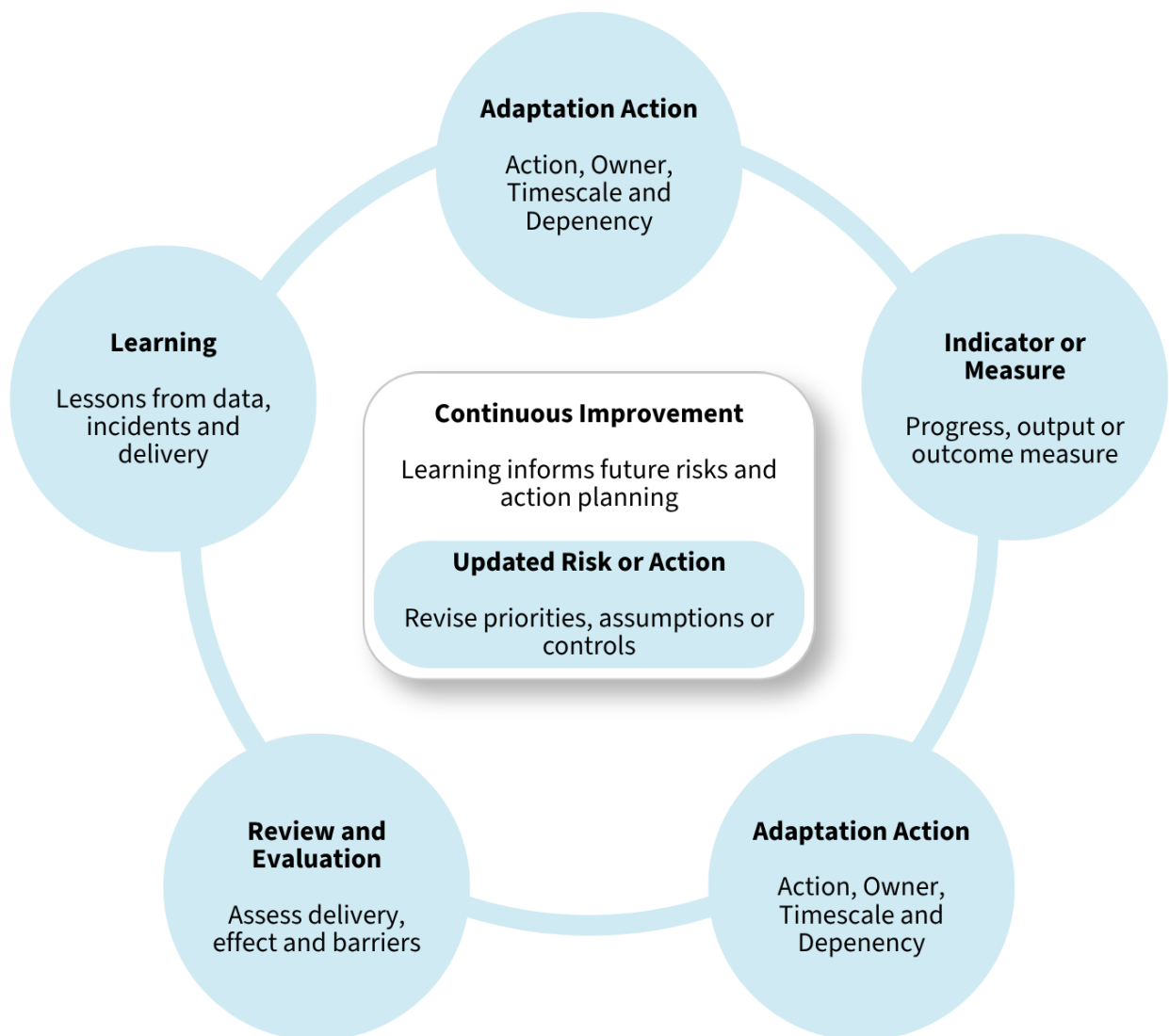
Implementation consideration	What should be in place
Action ownership	Each adaptation action has a named lead or accountable function.
Delivery route	Actions are linked to appropriate operational, estate, service, procurement, resilience or governance processes.
Resources and capacity	Resource requirements, workforce capacity and specialist input needs have been identified.

Implementation consideration	What should be in place
Dependencies	Key internal and external dependencies are recorded and managed.
Delivery risks and assumptions	Key assumptions, constraints and delivery risks that may affect successful implementation are identified and kept under review.
Governance and reporting	Progress reporting, escalation routes and assurance arrangements are agreed.
Communication	Relevant audiences and communication needs are identified.
Partnership working	External partners are engaged where actions depend on shared risks, infrastructure or delivery responsibilities.
Monitoring link	Actions are ready to be tracked through Phase 5 monitoring, evaluation and review arrangements.

7. Phase 5 Monitoring, Evaluation and Continuous Improvement

- 7.1. Phase 5 ensures that adaptation remains effective, proportionate and responsive over time. The purpose of this phase is to monitor delivery of adaptation actions, evaluate whether they are achieving their intended outcomes, and update risk understanding and priorities in response to new evidence, organisational change or climate-related events. These indicators and measures should be established at an early stage and not left until the monitoring and evaluation stage.
- 7.2. Monitoring and evaluation should not be treated as a separate exercise from implementation. Rather, they should form part of an ongoing cycle of learning and improvement, helping NHS boards understand whether actions are being delivered as planned, whether they are reducing risk in practice, and whether changes are needed to strengthen future resilience.
- 7.3. This phase should also support organisational learning. Climate-related incidents, near misses, new climate data, service changes and lessons from implementation may all provide important evidence for revising the Adaptation Plan (AP) and informing future decision-making.
- 7.4. Where climate-related incidents or disruption occur, NHS boards should use existing resilience, business continuity, risk and assurance reporting routes to capture lessons identified, financial or operational impacts, sustainability implications and any required updates to adaptation actions.
- 7.5. Figure 7.1 illustrates how monitoring, evaluation and learning should operate as a continuous cycle. Indicators and measures identified during planning are used to track delivery and assess whether actions are achieving their intended outcomes. The learning from monitoring, incidents, new evidence and implementation experience should then inform updates to risk assessments, adaptation action and priorities.

Figure 7.1 Monitoring, evaluation and learning cycle



Purpose of Monitoring and Evaluation

- 7.6. Monitoring and evaluation help NHS boards to understand whether adaptation actions are being delivered, whether they remain relevant, and whether they are contributing to improved resilience over time.
- 7.7. In practice, this phase should support NHS boards to:
- track progress against actions responsibilities and timescales
 - assess whether actions are reducing vulnerability, disruption or service risk
 - identify implementation barriers, unintended consequences or maladaptation
 - update priorities in response to new evidence, climate events or organisational change
 - support accountability, assurance and continuous improvement

- 7.8. Monitoring should focus not only on whether actions have been completed, but also on whether they are having the intended effect. This is particularly important where adaptation actions are delivered over longer timescales, depend on partnership working, or are integrated into wider capital, estate or service programmes.

Indicators and measures

- 7.9. NHS boards should identify a proportionate set of indicators or measures to help track implementation progress and evaluate outcomes. These should be aligned, where possible, with existing organisational data, reporting systems and assurance arrangements, rather than creating unnecessary parallel monitoring processes.
- 7.10. Indicators and measures identified during Phase 3 should be used in Phase 5 to monitor delivery, assess whether actions are achieving their intended outcomes, and support review of the AP. NHS boards should keep indicators under review to ensure they remain meaningful, feasible and aligned with current risks, available data and reporting arrangements.
- 7.11. Indicators may be selected across a range of categories, depending on local priorities, the nature of the actions being delivered, and the information already available through existing systems. The aim is not to create an exhaustive performance framework, but to support practical learning, accountability and improvement.

Table 7.1 Illustrative indicator categories for Phase 5

Indicator category	Illustrative examples
Service impact indicators	Service disruption, cancelled activity, continuity of urgent care, access impacts during extreme weather
Infrastructure indicators	Flood incidents, overheating events, utility interruptions, failure of critical plant or systems
Environmental or climate-related indicators	Recorded indoor temperature or threshold exceedances in selected high-risk spaces where monitoring is available, flooding occurrences, severe weather alerts affecting services
Workforce indicators	Staffing disruption, heat-related wellbeing concerns, workforce availability during climate-related events
Equity indicators	Impacts on vulnerable populations, disruption to priority services, access issues affecting at-risk groups.

Indicator category	Illustrative examples
Governance and implementation indicators	Progress against adaptation actions, reporting to governance structures, completion of scheduled plan reviews.

- 7.12. NHS boards should select indicators that are meaningful, proportionate and feasible to monitor. Monitoring should focus not only on whether actions have been completed, but also on whether they are contributing to reduced vulnerability, improved resilience and better continuity of service over time.

Reviewing the Adaptation Plan

- 7.13. The AP should be reviewed periodically to ensure that it remains current, relevant and aligned with organisational priorities and risk. Review arrangements should be proportionate and should normally include both routine reviews at planned intervals and additional reviews triggered by significant events or changes in context.
- 7.14. Review arrangements should align with relevant national policy requirements, including Director Letter (DL) (2021) 38 where applicable, and local governance cycles.

Table 7.2 - Review type and typical timing

Review type	Typical timing or trigger
Routine internal review	Annually or at other planned intervals agreed locally
Full plan revision	Every five years, or another agreed cycle aligned with organisational planning
Triggered review	Following major climate-related incidents, new climate data, significant service or estate change, or implementation learning indicating that priorities should be revised.

- 7.15. Review should consider:
- progress in implementing planned actions
 - whether actions remain appropriate and deliverable
 - whether risks, vulnerabilities or dependencies have changed
 - whether new actions or revised priorities are needed
 - whether implementation has revealed barriers, unintended consequences or opportunities for improvement

Example: Triggered review following a major climate event

An NHS board may undertake a scheduled annual review of its AP, but bring forward a fuller review following a major flooding event that disrupts access to services and exposes previously unrecognised infrastructure vulnerabilities. This review may lead to updates to the Climate Change Risk Assessment (CCRA), revised priorities and additional actions within the AP.

Updating Risk Assessments and Evidence

- 7.16. Monitoring and evaluation should inform updates to the CCRA and related evidence used in adaptation planning. Adaptation should remain responsive to changing climate conditions, improved hazard information, service transformation and learning from implementation or incidents.
- 7.17. NHS boards should consider updating their risk assessment or supporting evidence where:
- new climate projection data or hazard mapping becomes available
 - major climate-related events reveal previously unrecognised vulnerabilities
 - estate, service or infrastructure changes alter risk exposure or dependency
 - implementation experience suggests that earlier assumptions should be revised
 - new evidence emerges regarding vulnerable populations, operational pressures or interdependencies
- 7.18. Updating risk assessment in this way helps ensure that future adaptation planning remains evidence-informed, proportionate and responsive to changing circumstances. It also helps strengthen the link between monitoring, learning and future adaptation decision-making.

Learning and Sharing Across NHS Scotland

- 7.19. NHS boards should seek to use monitoring and evaluation not only for internal assurance, but also to support wider learning across NHS Scotland. Sharing experience can help improve consistency, reduce duplication and support faster uptake of effective adaptation approaches.
- 7.20. Learning may be supported through existing quality improvements and practice development approaches which could be done through:
- internal lessons-learned processes following climate-related incidents or implementation milestones
 - sharing of case studies, tools or approaches across NHS boards

- engagement with NHS Assure and other relevant national or regional networks
- contribution to wider resilience, sustainability or adaptation learning processes
- use of partnership forums, regional structures or professional networks to exchange practice

7.21. Where appropriate, NHS boards should consider documenting and sharing examples of successful adaptation delivery, implementation challenges and lessons from climate-related events nationally and internationally. This can help strengthen adaptation capability across the system and support continuous improvement over time.

Appendix A Illustrative governance roles and responsibilities for adaptation

A.1 This appendix provides an illustrative overview of governance roles and responsibilities that may support climate change adaptation planning and delivery within NHS boards. It is intended to clarify expected functions and accountabilities, while recognising that local governance arrangements, structures and job titles may vary.

Table A.1 - Illustrative roles and responsibilities

Role or group	Illustrative responsibilities
NHS board sponsor	Provides visible leadership for adaptation, supports strategic oversight, promotes adaptation as an organisational priority, and helps ensure that climate-related risks and actions receive appropriate attention through governance and decision-making routes.
Senior responsible owner/ adaptation lead	Encourages and coordinates adaptation activity across the organisation, supports planning and reporting, maintains momentum, helps connect relevant teams and processes, and ensures that adaptation actions are progressed through appropriate governance arrangements.
Cross-functional adaptation working group	Brings together relevant functions to support shared understanding of risks, review evidence, define scope, identify priorities and contribute to development, delivery and review of adaptation actions.
Estates and facilities	Contribute expertise on buildings, infrastructure, critical plant, utilities, maintenance, capital planning and estate-related resilience measures.
Clinical and operational teams	Contribute understanding of service delivery, patient safety, continuity risks, clinically sensitive functions and practical implications for care pathways and operations.

Role or group	Illustrative responsibilities
Emergency preparedness/ resilience	Contribute strategic knowledge and leadership as a Category 1 responder under the Civil Contingencies Act in relation to incident response, business continuity, escalation arrangements, preparedness planning, hazard management, care for people internally and through multi-agency partnerships, systems resilience, and corporate risk impacts, including the links between climate adaptation, emergency preparedness, and health and social care resilience.
Public health	Contribute understanding of population vulnerability, health inequalities, community impacts and wider health protection considerations.
Digital, procurement and finance functions	Contribute understanding of digital and supply dependencies, contract and procurement implications, financial planning and investment considerations.
Workforce/ organisational development	Contribute understanding of workforce resilience, staff wellbeing, training, awareness and organisational capacity.
Sustainability	Contribute understanding of climate and sustainability policy, support alignment between adaptation, net zero and wider sustainability activity, and help ensure adaptation is coordinated with relevant reporting, planning and improvement processes.
NHS board/ committee governance routes	Provide oversight, review progress, consider escalated risks or barriers, and ensure adaptation remains visible within routine assurance and decision-making processes.

Appendix B Illustrative Exposure Screening Template

B.1 This template is intended to support exposure screening for a specific climate hazard identified through the Climate Change Risk Assessment (CCRA), for example flooding, overheating or storm disruption. It may be repeated for different hazards as required. Its purpose is to help NHS boards identify whether particular assets, services or dependencies may be exposed, and whether further analysis is needed.

Table B.1 - Illustrative Exposure Screening Template - Hazard under consideration: Flooding

Asset, service or dependency	Relevant exposure considerations	Potential exposure identified	Evidence or information source	Initial Observations	Recommended next steps
Acute site A	Lower ground floor location; proximity to surface water flood area; critical utilities present	Yes	NHS Scotland Climate Mapping; Scottish Environment Protection Agency (SEPA) flood data	Critical plant may be exposed to flooding	Proceed to vulnerability considerations and targeted risk review
Acute site B - emergency department access route	Access route passes through area potentially affected by surface water flooding	Yes	NHS Scotland Climate Mapping Tool; site knowledge	Flooding may disrupt access for patients, staff or emergency vehicles	Proceed to vulnerability considerations

Asset, service or dependency	Relevant exposure considerations	Potential exposure identified	Evidence or information source	Initial Observations	Recommended next steps
Community hospital C - digital infrastructure	Reliance on local external power and communication infrastructure in flood-prone area	Possible	Local infrastructure information; incident records	Potential indirect exposure through infrastructure dependency	Proceed to vulnerability considerations
Acute site D	No relevant exposure identified through initial flood screening	No	Site review; flood mapping	No material exposure identified at this stage	No further analysis at this stage; keep under review

- B.2 Relevant exposure considerations may include, as appropriate, geographical location in relation to mapped hazards, siting of critical plant or equipment, building characteristics, dependence on external infrastructure, reliance on uninterrupted access or environmental control, and relevant historical incidents.
- B.3 Where no material exposure is identified, no further analysis may be required at that stage. Where potential exposure is identified, NHS boards should consider whether vulnerability considerations and, where necessary, targeted risk review are required.

Appendix C Worked example: from priority to adaptation actions

- C.1 This worked example illustrates how a priority flood risk identified through Phase 2 may be translated into adaptation objectives, options and actions within the NHS board Adaptation Plan (AP).

Table C.1 - Worked example: From Priority Flood Risk to Adaptation Actions

Aspects	Description
Context	During Phase 2, the NHS board's Climate Change Risk Assessment (CCRA) identifies flooding as a significant climate-related risk affecting selected acute sites. Exposure screening, informed by the NHS Scotland Climate Mapping Tool and other relevant local data, indicates potential exposure of site access routes, lower ground floor plant areas and critical infrastructure to river and surface water flooding.
Vulnerability Considerations	Further review highlights factors that increase the significance of the risk, including reliance on uninterrupted access for emergency and clinical services, the location of critical plant and equipment, dependence on external utilities and digital systems, and the presence of vulnerable patients requiring continuous care.
Targeted risk review	In response, the NHS board undertakes targeted site-specific review for the highest-risk acute sites to improve understanding of likely service and infrastructure impacts. This may include more detailed examination of flood pathways, drainage, critical infrastructure location, access arrangements and operational implications for priority services.
Adaptation objective	Reduce disruption of critical services and protect essential infrastructure at higher-risk acute sites during flood events, while improving long-term resilience

Aspects	Description
Appraisal considerations	Options are appraised for effectiveness in reducing flood-related disruption, feasibility within the site and operational context, impact on patient safety and service continuity, implications for vulnerable services and populations, cost and value for money, co-benefits, and alignment with estate planning, capital investment and sustainability objectives.
Actions selected	A combination of actions is selected, including near-term operational measures such as updated flood response and continuity procedures, planned enhancement actions such as improved drainage and access planning, and strategic or capital-linked actions such as relocation of vulnerable infrastructure and incorporation of flood resilience into future estate renewal.
Integration into the AP	The NHS board records these actions within the AP, assigning lead responsibility, indicative timescales, links to estate, resilience or capital planning processes, and monitoring and reporting arrangements through existing governance routes.

Appendix D Relevant tools, data sources and guidance

- D.1 This appendix provides a summary of selected tools, data sources and guidance documents that may support NHS boards in applying this Scottish Health Technical Note (SHTN). It is not exhaustive and should be used alongside local evidence, technical guidance and organisational processes where relevant.

Table D.1 - Tools, data sources and guidance

Resource, tool or guidance	Purpose in relation to this guidance	Relevant phase(s)
Public Sector Climate Adaptation Capability Framework	Resource for organisational capability, maturity assessment and continuous improvement	Phase 1
NHS Scotland Climate Change Risk Assessment (CCRA) and Adaptation Planning Tool	Supports structured identification, assessment and recording of climate-related risks and adaptation actions.	Phases 2-3; Phase 4-5 where used to track actions
NHS Scotland Climate Mapping Tool	Supports identification of potential exposure to relevant climate hazards, particularly for estate and site-level screening.	Phase 2
NHS Scotland CCRA and Adaptation Plans: A Summary Report	Provides national context, examples of current practice, and common themes emerging from NHS board-level risk assessments and adaptation plans (APs).	Phases 2-3
UK Climate Projections (UKCP)	Provides climate projection data to support understanding of future climate conditions and associated risks.	Phases 2 and 5
Met Office climate information and weather data	Supports consideration of climate trends, hazards and severe weather information.	Phases 2 and 5

Resource, tool or guidance	Purpose in relation to this guidance	Relevant phase(s)
SEPA flood maps and related environmental data	Supports identification of flood-related hazards and potential site exposure.	Phase 2
SHTN 02-01 Sustainable Design and Construction (SDaC)	Supports implementation of estate, design, refurbishment and capital-related adaptation actions, including wider sustainability considerations	Phases 3-4
Health Building Note (HBN) 00-07 Planning for a Resilient Healthcare Estate	Supports assessment and implementation of estate resilience measures, particularly where infrastructure and interdependencies are affected.	Phases 2-4
Applicable Scottish Health Technical Memoranda (SHTMs)	Support implementation of actions relating to critical engineering systems, utilities and infrastructure resilience.	Phases 2-4
Adaptation Scotland resources and Climate Ready Regions/ Regional Adaptation Partnerships	Support wider adaptation planning, partnership working and regional alignment.	Phases 1, 4 and 5
NHS Scotland Adaptation Resource Hub	Provides NHS Scotland boards trusted tools, guidance, and case studies to support decision-making at every stage of the journey of preparing for and responding to the health challenges of climate change.	All phases
World Health Organization (WHO) Operational Framework for Building Climate-resilient and Low-Carbon Health Systems	Provides international good practice on climate-resilient health system planning, implementation, monitoring and learning.	All phases
International Organization for Standardization (ISO) 14090 and ISO 14091	Provide recognised international principles and guidance on adaptation planning and climate risk assessment.	Phases 1-3

- D.2 NHS boards should use these resources in a way that is proportionate to local context, organisational maturity, service profile and the significance of identified climate risks.

Draft for Consultation

Abbreviations

AP:	Adaptation Plan
CCRA:	Climate Change Risk Assessment
CCRA4-IA:	Fourth Climate Change Risk Assessment - Independent Assessment
DL:	Director Letter
EPRR:	Emergency Preparedness, Resilience and Response
HBN:	Health Building Note
ISO:	International Organization for Standardization
SDaC:	Sustainable Design and Construction
SEPA:	Scottish Environment Protection Agency
SHTM:	Scottish Health Technical Memorandum
SHTN:	Scottish Health Technical Note
SNAP3:	Third Scottish National Adaptation Plan
UKCP:	UK Climate Projections
WHO:	World Health Organization

Glossary

Adaptation – Action taken to prepare for, respond to and manage the impacts of current and future climate change.

Adaptation Action – A measure, intervention or change intended to reduce climate risk, vulnerability or disruption, or to realise a resilience-related opportunity.

Adaptation Plan – The document set of adaptation objectives, actions, responsibilities and monitoring arrangements developed in Phase 3.

Adaptive Capacity – The ability of an organisation, service, asset or population to anticipate, cope with, respond to and recover from climate-related impacts.

Climate Change Risk Assessment (CCRA) – A structured assessment used to identify, analyse and prioritise relevant climate-related risks.

Climate Hazard – A climate-related trend that may cause harm or disruption, such as flooding, overheating, drought or storm events.

Co-benefits – Additional positive outcomes delivered by an adaptation action, for example improved patient comfort, reduced emissions or lower operational costs.

Exposure – The extent to which an asset, service, population or dependency may be affected by a climate hazard.

Exposure Screening – A high-level review used to identify whether assets, services or dependencies may be exposed to a relevant climate hazard.

Maladaptation – An action intended to reduce climate risk that inadvertently increases vulnerability, emissions, cost or other negative consequences over time.

Monitoring and Evaluation – The ongoing process of tracking implementation, assessing effectiveness and using evidence to inform review and improvement.

Nature-based solutions – Measures that work with natural processes or systems to reduce risk and support resilience, for example sustainable drainage, rain gardens or tree planting.

Resilience – The ability of services, systems, assets and organisations to anticipate, withstand, respond to and recover from disruption.

Sensitivity – The degree to which an asset, service or population may be affected if exposed to a climate hazard.

Targeted Risk Review – More detailed review undertaken where earlier assessment steps indicate elevated, uncertain or potentially significant risk.

Vulnerability – The extent to which an asset, service or population is susceptible to harm, reflecting the interaction of exposure, sensitivity and adaptive capacity.

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