

PROCURING FOR ADAPTATION

INCORPORATING CLIMATE ADAPTATION INTO HEALTHCARE INVESTMENT DECISIONS

A GUIDE FOR HEALTHCARE ORGANISATIONS



Version Control

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1 Introduction

The Earth's climate is changing. Healthcare organisations face double consequences of climate change risks. Rising temperatures and more extreme weather impact human health directly by exacerbating existing health conditions, as well as indirectly by changing the kinds of illnesses and disease we need treatment for. This means that healthcare service provision will need to be reconfigured in the future. In addition, changes in climate will simultaneously work to undermine the buildings and facilities healthcare that the same organisations operate within. The health sector therefore needs to adapt its infrastructure to changes in the kinds of treatment people need to receive, as well improving the resilience of those facilities to the physical challenges of climate change.

The purpose of this document is to articulate a set of principles that healthcare organisations can use to navigate the process of securing funding and procuring interventions that help support adaptation of healthcare infrastructure to the risks posed by climate change. It is intended to complement more general guides on sustainable procurement.

The intended audience includes hospital managers, finance and procurement

1.1 Focus and Scope

This guide is about climate change adaptation (climate adaptation) in healthcare settings and focuses on structural measures to reduce climate risks as shown in Figure 1.

- It is directed at the health sector in Europe, although the principles may equally apply in other parts of the world.
- It covers climate change adaptation, rather than mitigation.
- It covers structural adaptation, rather than other kinds of non-structural adaptation measures.
- It is targeted at estate and facility level rather than at sector or system level.

Climate adaptation is the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit

beneficial opportunities¹. It is about making changes now, so that organisations and buildings are less likely to be negatively

professionals (internal and external to the facility), and estates and facilities management professionals who may require guidance on the kinds of questions to ask when making decisions during this process. 'Healthcare organisation' is a term we are using in this document to describe any organisation providing healthcare services – it is intended to be of benefit to any size of healthcare providers from smaller local organisations to large multi-national organisations and its content may be relevant to those directly making procurement decisions, setting healthcare procurement strategies, funding adaptation in healthcare and setting national and international policy.

It is influenced by diverse literature available across climate adaptation, procurement, and healthcare infrastructure (See a table of the key documents we have taken inspiration from in Appendix A: Key literature and references as readers may wish to explore these for additional insight). We found that there was no single document which was able to draw all of the relevant content into one place and so we hope that this Procuring for Adaptation Guide addresses that gap in the health sector climate adaptation sphere.

beneficial opportunities¹. It is about making changes now, so that organisations and buildings are less likely to be negatively

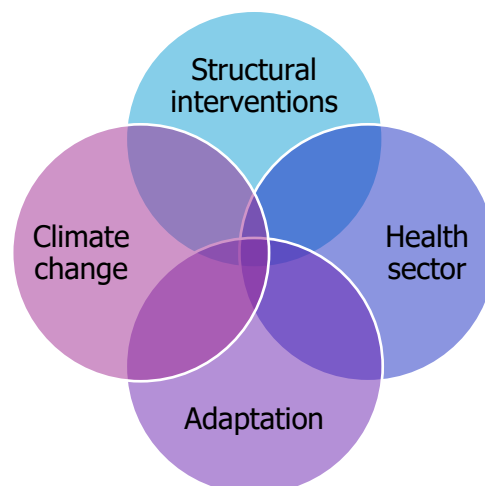


Figure 1: The combined focus of this guide

impacted by the consequences of climate change. Some of these effects are present now and may increase in likelihood, frequency or impact; others have not yet had an impact.

Climate mitigation on the other hand refers to changes different actors need to make, in order to reduce their contribution to the causes of climate change. These actions reduce the rate of climate change¹ and tend to focus on reducing Greenhouse Gas (GHGs) emissions.

Whilst there are clearly links between adaptation and mitigation, this guide specifically focuses on the former. This is because, to date, significantly more attention, funding and effort has been focused on mitigation efforts² rather than adaptation. Furthermore, we have observed that often even interventions labelled as ‘adaptation’ might better be categorised as ‘mitigation’. Examples we found focused on reducing emissions rather than responding to the changing climate (e.g. reducing waste streams, recycling, reducing single use items, etc.). Whilst these are important activities in a healthcare setting, they are not in the scope of this guide.

Our attention to adaptation in healthcare settings is important for a range of reasons. Our initial research has highlighted a gap in guidance for hospitals and clinics on how to incorporate adaptation into their procurement practices. Healthcare providers are part of complex and varied organisational structures that are critical to the functioning of society, both in terms of general healthcare provision as well as healthcare in response to those injured in climate driven extreme weather events. Healthcare settings will be doubly impacted by climate change – not only by the physical risks but also the changing health risks on the population and disease pathways. Additionally, a huge proportion of public spending is on healthcare, therefore the sector has a big influence on what is procured and therefore has the potential to strongly influence the way procurement is done so that it supports adaptation.

Interventions can be categorised as³:

1. Governance and institutional: policy instruments, regulations and mechanisms to support and streamline adaptation;
2. Economic and finance: insurance, economic incentives and innovative financing mechanisms;
3. Physical and technological: early warning systems (EWS), mapping, physical infrastructure and other sector-specific innovations;
4. Nature-based solutions (NBS) and ecosystem-based approaches: measures integrating nature, including green infrastructure, tree cover, water and soil regeneration;
5. Knowledge and behavioural change: awareness raising, knowledge sharing and actions encouraging changes in consumption and lifestyle patterns.

This document focuses on adaptation of the health sector’s physical spaces and environments – buildings, utilities, land within which and through which healthcare activities are delivered. Therefore, we mostly address categories 3 and 4. Categories 1 and 2 tend to be acted on at a national/regional/sectoral level and category 5 relates to less tangible activities.

Structural measures involve physical construction or technologies to reduce or avoid possible impacts of hazards, or to achieve hazard resistance and resilience in structures or systems. In contrast, non-structural measures use knowledge, practice or agreement to reduce disaster risks and impacts, in particular through policies, process redesign and legislation, awareness raising, training and education⁴. This also includes having emergency response plans and arrangements in place, providing funding for adaptation and having appropriate governance and decision making in place to respond to climate change risks. This document focuses on structural change to hospital infrastructures and tangible parts of healthcare facilities. Whilst non-structural adaptation measures are still important, they are not the focus of this guide.

1.2 Key Terms

When engaging with stakeholders from different backgrounds or disciplines, it can be helpful to discuss and agree key terms that will be used in the project to avoid the potential for confusion and misunderstanding. We use the following key terms in the guide. Some people may use

these terms in similar, but subtly different ways (often as a result of how their discipline has engaged with the term historically). People might also use other terms not included here, to describe the same things. (References are provided and these are listed in full in the References section).

Adaptation Communication	Each Paris Agreement signatory should submit and update periodically an adaptation communication, which may include information on its priorities, implementation and support needs, plans and actions. This is often done in conjunction with Nationally Determined Contributions (see item), but specifically focuses on adaptation. ⁵
Adaptation pathway	A series of adaptation choices involving trade-offs between short-term and long-term goals and values. ¹
Adaptive capacity	Ability of systems, institutions and other human organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences. ⁶
Alliance Contracting	A contracting structure in which multiple organisations, both buyers and suppliers, agree to work collaboratively to deliver agreed services. There is a leadership team, but all members are equally valued and have equal say in significant collective decisions, rather than the main contractor-sub-contractor model. ⁷
Building Resilience	The ability of a building and its component parts to withstand current and future climatic conditions (including wildfires/bushfires, extreme wind, extreme precipitation and extreme temperature), to minimize the loss of functionality and recovery while sustaining damage proportionate to the intensity of the events experienced, and preserving the intended level of performance at the time of construction over the proposed design life of the building ⁸ .
Climate bonds	Fixed-income financial instruments (bonds) linked to climate change solutions. They are issued in order to raise finance for climate change solutions, for example mitigation or adaptation related projects. Like normal bonds, Climate Bonds can be issued by governments, multi-national banks or corporations. Issuing entity guarantees to repay the bond over a certain period of time, plus either a fixed or variable rate of return ⁹
Climate Change Adaption/ Climate Adaptation ('Adaptation')	Refers to the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities ¹ . It is about making changes now, so that organisations and buildings are less likely to be negatively impacted by the consequences of climate change. Some of these effects are present now and may increase in likelihood, frequency or impact, others have not yet had an impact.
Climate Change Mitigation ('Mitigation')	Changes needed by different actors, in order to reduce their contribution to the causes of climate change. These actions reduce the rate of climate change ^{1,10} .
Climate finance	Local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change ¹¹ .
Climate fund	In general, financial terms, a fund is a pool of money set aside for a specific purpose. The money in a fund is often invested and professionally managed in order to generate returns for its investors. Some common types of funds include pension funds, insurance funds, foundations, and endowments. A climate fund is a pool of money which is specifically invested in projects related to climate change. The money can come from private investors, corporations or governments. There are various formal funds (e.g. GEF, GCF, SCCF, LDC, Adaptation Fund) which support the funding of climate change

A guide for incorporating climate adaptation into healthcare investment decisions activities, and which are administered through formal protocols to meet international climate change agreements^{12,13}.

Climate Resilience	The capacity of social, economic and ecosystems to cope with a hazardous event or trend or disturbance ¹ . It includes the abilities to reorganize and learn.
Development Finance Institutions (DFIs)	These are specialised development organisations that are usually majority owned by national governments. DFIs invest in private sector projects in low- and middle-income countries to promote job creation and sustainable economic growth and in some cases Adaptation ¹⁴ . The term 'DFI' includes multilateral development banks (MDBs); other international and regional financial institutions; national development banks; export credit agencies; and private lenders ¹⁵ .
Funding / Financing	In this document funding is used to talk in general about getting up front money to pay for goods and services. Financing to be used to talk more specifically about particular instruments used to facilitate the payment including taking on debt (see also Zerbe ¹⁶).
Framework Agreement	An agreement or other arrangement between one or more buying authorities and one or more suppliers which establishes the terms (in particular the terms relating to price and, where appropriate, quantity) under which the supplier will enter into one or more contracts with the contracting authority in the period during which the framework agreement applies (normally for a specified maximum period of time). Once an agreement has gone live, no new suppliers can be added to the framework. Would-be suppliers must wait for tenders for new frameworks to be published.
Green financing	is about increasing the level of financial flows (from banking, micro-credit, insurance and investment) from the public, private and not-for-profit sectors to sustainable development priorities. A key part of this is to better manage environmental and social risks, take up opportunities that bring both a decent rate of return and environmental benefit and deliver greater accountability ¹⁷ .
Green procurement	Green procurement is sometimes also called sustainable procurement, or green purchasing policy. It is put in place to guide businesses when acquiring materials, supplies and services and selecting such products based on their impact on the environment and human health ¹⁸ .
Green public procurement	A process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured ¹⁹ .
Healthcare [health care]	In this document we use the term 'healthcare', unless we are referencing an organisation name or document name where 'health care' is used. We are using 'healthcare' to refer to a system which provides services to maintain and improve human health, and involves preventing, diagnosing and treating mental and physical illnesses, diseases and injuries.
Hazard	Potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources ¹ .
[Climate] Impact	Consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather/climate events), exposure, and vulnerability. Impacts generally refer to effects on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure. Impacts may be referred to as consequences or outcomes and can be adverse or beneficial ¹ .
Interventions (measures)	In this document we use 'intervention' to describe an action that can be taken to make a change. We are using it in the context of making a positive change (adapting) in relation to climate change risk. Sometimes the term 'measure' is used interchangeably with intervention, however this can be confused with unit of measurement, so where possible we avoid that term here.

National Adaptation Plan (NAP)	Some Paris Agreement countries formulate and implement NAPs with a view to identifying medium- and long-term adaptation needs, and developing / implementing strategies and programmes to address those needs ²⁰ .
Nationally Determined Contributions (NDCs)	The Paris Agreement requires signatories to outline and communicate their post-2020 climate actions – known as NDCs. These are the intended efforts by each country to reduce national emissions and adapt to the impacts of climate change ²¹ .
Non-structural measures	Use of knowledge, practice or agreement to reduce disaster risks and impacts, in particular through policies, process redesign and legislation, awareness raising, training and education ⁴ , which includes having emergency response plans and arrangements in place ⁴ . See also Structural measure below.
Physical [climate] risks	Risks arising from a changing climate which can result from long-term changes in climatic patterns (chronic risks) and frequency increases of extreme weather events (acute risks) ²² . Physical risk is the potential for physical damage and financial losses as a result of increased exposure to climate hazards ²³ .
Procurement	The process of finding and agreeing to terms, and acquiring goods, services, or works from an external source, often via a tendering or competitive bidding process. It can be characterised as the buying of goods and services that enable an organisation to operate its supply chains, in a profitable and ethical manner ²⁴ .
Public-Private Partnerships (PPPs)	Long-term agreements between a government and a private partner whereby the private partner delivers and funds public services using a capital asset, sharing the associated risks. The private party bears significant risk and management responsibility, and remuneration is linked to performance. PPPs may deliver public services both with regards to infrastructure assets (such as bridges, roads) and social assets (such as hospitals, utilities, prisons) ²⁵ .
[Climate] Risk	The effect of uncertainty and a potential for deviation from an expected outcome - adverse consequences for human or ecological systems, recognising the diversity of values and objectives associated with such systems. Climate change risks can arise from potential impacts of climate change as well as human responses to climate change. Climate risks result from dynamic interactions between climate-related hazards with the exposure and vulnerability of the affected human or ecological system to the hazards – not only the physical risk but risks that emerge from our responses to climate risk management. Climate risks result from the potential for such responses not achieving the intended objective(s), or from potential trade-offs with, or negative side-effects on, other societal objectives, such as Sustainable Development Goals (SDGs). Risks can arise, for example, from uncertainty in implementation, effectiveness or outcomes of climate policy, climate-related investments, technology development or adoption, and system transitions ¹ . This is sometimes called ‘transition risk’ in contrast to ‘physical risk’ (see relevant definitions).
Structural measures	These involve physical construction or technologies to reduce or avoid possible impacts of hazards, or to achieve hazard resistance and resilience in structures or systems ⁴ .
Transition risks	Risks arising from the transition to a lower-carbon economy. Transitioning to a lower carbon economy may entail policy, legal, technological and market changes which may pose varying levels of economic, financial and reputational risk ²² .
Vulnerability	The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt ¹ .

2 Procurement for Adaptation

2.1 Procurement in Healthcare

Procurement for climate adaptation concerns procurement both of goods or services with climate adaptation being the primary goal of the purchase, as well as acquiring goods and services which—whilst driven by other needs—have a secondary positive contribution to responding to climate change risks.

The healthcare sector is a major purchaser of goods and services in any economy and it also a major contributor to emissions and energy usage. With so much spending power, the health sector not only has multiple opportunities to make a positive impact on climate change adaptation through procurement, but also the decisions that are taken within the health sector have the opportunity to drive wider climate adaptation innovation. The health sector can signal to suppliers, through procurement strategies and choices, the kinds of goods and services that it

needs (now and in the future) to address the impacts of climate change on facilities.

Public buying or public procurement is the purchase of goods, services and works by public authorities or civil service organisations using public funds. Even when delivered by a private organisation, these services may still be considered public and come under more general public procurement rules set at a national level in regard to spending of public funds. EU directives on public procurement may apply on certain purchases. The core principles in EU transactions are transparency, equal treatment, open competition, and sound procedural management³¹. Public procurement—particularly health sector, due to its purchasing power and size—is increasingly seen as a policy lever for achieving government policy goals including sustainability and climate change mitigation and adaptation³².

2.2 Sustainability in Procurement

‘Sustainable’, ‘ethical’ and ‘green’ procurement are often used relatively interchangeably to describe broadly the same kinds of activities which consider the wider implications of purchasing choices beyond financial decisions and can also be known as environmentally preferable purchasing (EPP). These kinds of procurement practices all recognise that purchasing decisions ought not be based solely on the lowest price and obtaining cost reductions for goods and services, but might also seek to create social/environmental benefits, while preventing or mitigating any adverse social and/or environmental impact generated by the completion of a contract. However, some organisations use the terms in ways which highlights a subtly different focus. For example, ‘ethical’ procurement focuses on ensuring an organisation is able to manage the procurement processes in a way which maintains and upholds the organisation’s ethical values (which might for example relate to the way individuals are treated). ‘Green’ procurement, is more likely to focus more specifically on the environmental aspects of procurement. ‘Sustainable’ procurement is a

relatively inclusive term, and the one that we will continue with here, as it is concerned with the well-rounded development of an organisation’s sustainability.

Sustainable procurement is built on three pillars (adapted from Safdie¹⁸):

- **The economic pillar** focuses on maintaining economic growth and development often through efforts to mitigate environmental harm incurred through the organisation’s operational and financial activities (e.g. how the hospital operates and what it spends money on to remain a viable organisation).
- **The social pillar** relates to how an organisation addresses social value within operational and financial activities. This includes promoting individual rights, respect, and equality, preventing discrimination, promoting solidarity, fair wages, and ensuring the well-being of stakeholders impacted by the organisation’s activities.
- **The environmental pillar** is about the organisation’s commitment to protecting

the environment, such as by reducing various environmental risks, seeking to reduce emissions, or altering their business models to not have such a heavy environmental impact.

The three pillars are applied to a healthcare context in Figure 2 below:

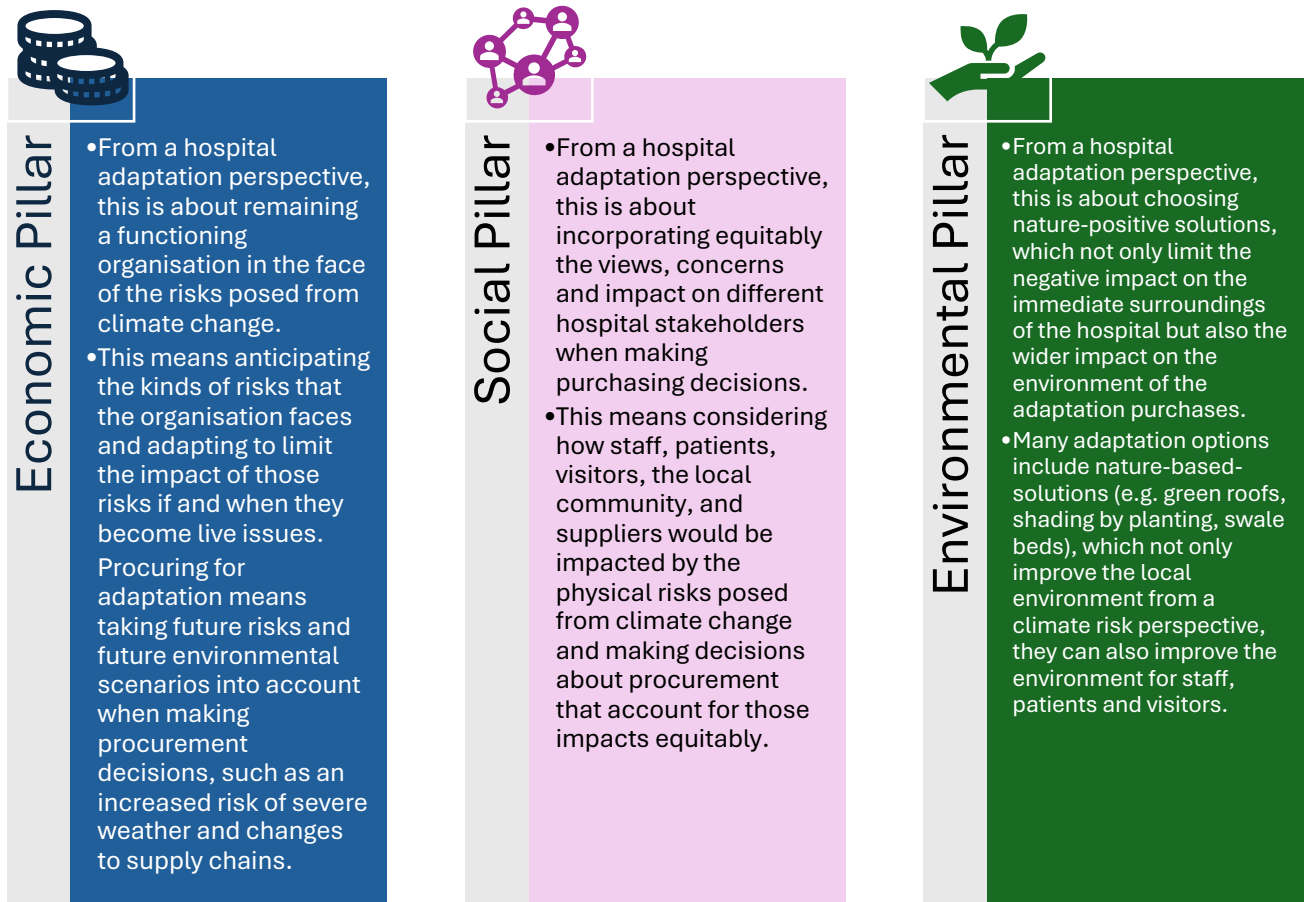


Figure 2: Thinking about healthcare adaptation procurement in relation to the three pillars of sustainable procurement

This guide does not suggest an alternative to ‘sustainable’ procurement. Instead, we want to ensure that ‘sustainable’ procurement of goods

and services also involves making choices that support healthcare climate resilience and adaptation, as well as mitigation and carbon reduction.

2.3 Challenges of Procuring for Adaptation

Healthcare procurement in general faces several challenges which (whilst not unique to health) are particularly relevant to the sector, and which will also present a challenge when considering procuring for adaptation. Firstly, health sector transactions can be very complex, involving procuring goods and services that are installed for long periods of time or at significant volumes. They are also often subject to very stringent medical regulation and standards,

which limit the number of players in the market and increase procurement and development timescales. Another common challenge is that policy objectives in the health sector can be mutually conflicting, so procurement for one objective may be out of step with another. Furthermore, there can be an ‘imbalance of power between the procurer and the provider on each side of the transaction. This is especially true where factors limit competition on the

provider side (barriers to entry, monopoly etc.) or on the side of the purchaser (small purchaser with limited technical skills)³³.

Procuring for projects with a specific adaptation outcome aim can therefore be challenging (summarised in Table 1). This is because the most impactful healthcare adaptation interventions need to be innovative, can be quite complex, involve buying goods which may need to last decades, and may need to involve

new and different ways of working with suppliers. Infrastructure adaptation projects are particularly difficult as contractors with extensive infrastructure experience, may have little to no experience of incorporating climate resilience planning into their projects. It may be a challenge for them to incorporate the long-term costs and planning considerations required and they may tend to focus on traditional methods or products, when more innovative solutions might be more suitable.

Table 1: Table showing challenges facing healthcare organisations when procuring for adaptation

Theme	Challenge in more detail
Longer procurement process	The process to selecting a vendor, then developing and implementing a solution may take longer than more traditional healthcare procurement. The procurement process is likely to be faster and simpler if products and services are routinely available, as this would use existing suppliers, common products and high-volume purchases.
Finding a suitable supplier might be difficult	Traditionally, organisations procure from a wide pool of suppliers to ensure market equity and a competitive environment. This may not be possible for adaptation procurement. Healthcare organisations might struggle to find any suitable suppliers at all, particularly if there is no (or a limited) market for, or suppliers of, the goods and services sought. Suppliers might view climate adaptation projects as uncertain and higher risk, meaning they are unwilling to put a bid in. This may be more of a problem in countries and healthcare systems where climate adaptative thinking is less developed. Opportunities might exist to share risk between stakeholders, making the project seem more attractive to potential suppliers, who might otherwise be put off by the risks/uncertainties involved. Some suppliers may feel like they are being pushed out of the market or disadvantaged in the event that the healthcare organisation specifies one green product, which is only made by one supplier (and not them).
Supplier engagement may look different to traditional ways of working	Healthcare organisations may have to engage differently and with new suppliers to provide the new products needed for adaptation. They may not be able to rely on organisations they have established and trusted relationships with. They may need to engage earlier than normal with existing and potential vendors about the problem and likely intervention, as well as signalling their sustainability and adaptation priorities to suppliers to encourage innovation. Suppliers might need more time to undertake development work, form new collaborations with other suppliers and to demonstrate they can provide any new innovative solution they claim to have. Undertaking due diligence and assurance can take time.
Transformative change requires thinking about the whole system	Adaptation requires a holistic approach over time to achieve long-term transformative change over the whole system. Traditional procurement can be quite piecemeal, project by project and focused on cost-savings in the short-term ³⁴ . This could mean systemic and interrelated challenges are not addressed collectively and risk are transferred to other parts of the healthcare system. Transformative change also requires procurers to consider whether the item is needed in the first place.
The market and the solutions are uncertain and changeable	Adaptation requires flexibility and agility because climate change science is a developing area. Healthcare organisations may already be locked into practices and longer-term contracts which maintain the existing procurement landscape and fix procurement practices. Outcomes-based approaches can provide flexibility to deal with the high levels of uncertainty surrounding climate change ³⁴ . This is because it is not always clear over the lifetime of the intervention what might be required of it – so the intervention should include flexibility to ensure continuity of service in a changing physical and supply chain environment.

3 Procurement for Adaptation Principles

This section introduces a set of principles which healthcare organisations can use by overlaying onto existing sustainable procurement processes, in order to promote the kinds of procurement which supports infrastructure adaptation to climate change-driven risks. Although the principles have been written primarily for healthcare facilities, they may be applicable to other sectors. It was initially informed by the 10 Principles for Green Purchasing, developed by SkiftNorge³⁵.

Promoting healthcare procurement which supports climate adaptation is important because the health sector is a major procurer of goods and services. The health sector therefore

has a lot of influence through the process of procurement, on both the kinds of goods and services that are procured as well as the way that procurement is done. Healthcare procurement can be a driver of innovative adaptation. The procurement of any healthcare goods or services can in some way contribute to a more climate resilient hospital, through changes in everyday procurement processes. Additionally, when procuring a product or services specifically in order to make a climate adaptation intervention on healthcare infrastructure, decision-makers in healthcare need to be able to know how to make good decisions when investing for the sake of adaptation.

3.1 The Principles: Overview

The principles for procuring adaptation are grouped together under three headings in Figure 3. By applying the principles to existing procurement structures and processes, procurement and investment decisions are more likely to be able to support adaptation. The principles can be applied to the procurement process as a whole, and at any

time, although creating an adaptive procurement provides the adaptive context within which specific procurement decisions are taken. ‘Products for the future’ and taking ‘a systems approach’ to selection relates more to making procurement decisions about specific products. In the rest of this section, each of these three headings is examined in more detail.

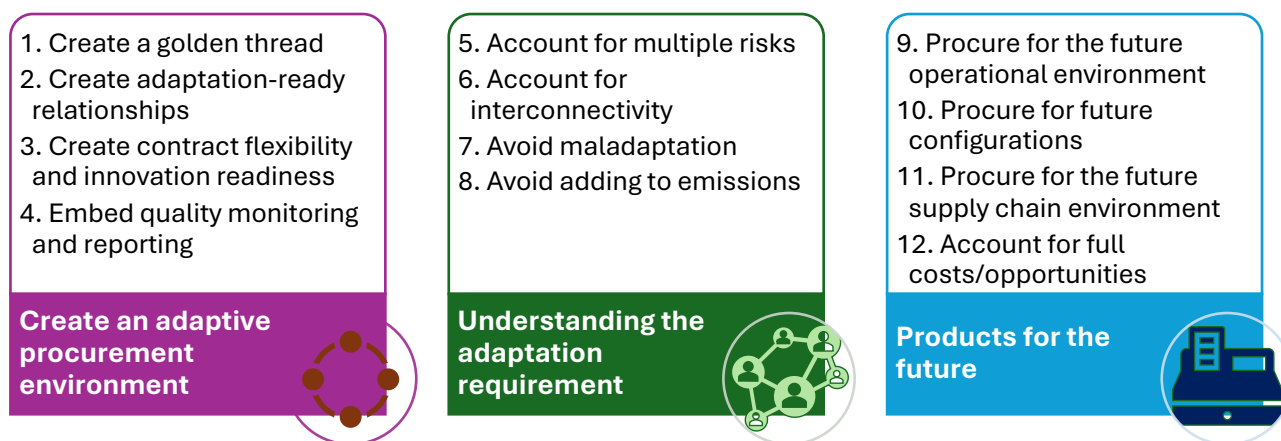


Figure 3: Overview of the Procurement for Adaptation Principles

3.2 The Principles: Detail

3.2.1 Create an adaptation-ready procurement environment

environment so that it is conducive to making decisions which support adaptation.

Table 2 describes the first four principles, which are about changing the procurement

Table 2: Principles 1-4: Creating an Adaptation-Ready Environment

Principle		Demonstrate this principle by:
<p>1. Create a golden thread</p> <p>The organisation’s vision, strategy and risk register specifically should be explicit about making sure the organisation is adapted to face the challenges posed by climate driven risks. These documents should be publicly available and easy to read. They should also make clear how the organisation’s adaptation visions and goals link to those of the health sector, the region, country and also to international commitments to climate adaptation.</p>	<ul style="list-style-type: none"> • Ensuring the hospital’s [sustainable] procurement strategy specifically refers to adaptation, how procurement will support adaptation positive choices. • Ensuring the hospital’s [sustainable] procurement strategy describes how it contributes to and links to international, national and sectoral adaptation goals. • Ensuring the [Sustainable] procurement strategy is freely visible to suppliers who will need to know the organisation’s intentions. • Ensuring the organisation’s [Sustainable] procurement plan is explicit about how it will contribute to the hospital’s adaptation ambitions. 	
<p>2. Create adaptation-ready relationships</p> <p>Does the procurement process foster good relationships and promote innovation?</p> <p>This principle is creating a procurement environment which is suited to promote adaptation and can take advantage of innovation. This means having sufficient resources allocated to procurement, empowering procurers to take the right procurement decisions and establishing the positive relationships with suppliers who embed adaptation in their own practices and supply goods and services which meet the needs of the sustainable procurement strategy.</p> <p>The right environment is not located in one single document or one single motivated person; creating an adaptation positive procurement environment is the combination of informed practices underpinned by documented and consistent approaches and supported by leaders and appropriate funding mechanisms.</p>	<ul style="list-style-type: none"> • The hospital’s procurement strategy covers adaptation (under sustainability) and is promoted to and available to suppliers. • Ensuring staff involved in procurement decisions have received appropriate training on the organisation’s vision, strategy and plan for adaptation, and how to incorporate these into their own practices. They know what the organisation wants from procurement in relation to adaptation, how to incorporate adaptation into the procurement process and practically how to embed it into procurement practice. • Ensuring expertise is available to drafting business cases and undertake analysis needed to support funding / financing bids for procure adaptation interventions. • Inviting suppliers to hear about new projects in the development phase – may need to develop novel solutions. • Creating spaces for ongoing dialogue with suppliers - this is transparent, constructive and open, promoting innovation. • Encouraging vendors to tell the hospital about their capacity and capability to meet requirements and if they need development time • Training should be provided to those involved in procurement decisions. 	

<p>3. Create contract flexibility and innovation readiness</p> <p>This is about having a creating a procurement environment which is adaptive to innovation, uncertainty and novel ideas (see also 'Innovation Procurement'³⁶).</p> <p>Longer-term procurement and management contracts can lock in certain terms / kinds of products, limiting innovation and the benefit from new products.</p> <p>Problems presented by a changing climate may not yet be addressed within the healthcare organisation's existing supply chain. Some solutions will not have been invented yet and suppliers may need time to develop good proposals. The process for engaging with suppliers might need to change with additional time at the start of the process to flag to potential suppliers what kinds of outcomes are required and the standards involved.</p>	<ul style="list-style-type: none"> • The hospital's contracts are designed to take advantage of new and innovative products, rather than being trapped in long-term contracts which support the continued use of old inefficient products. • Ensuring training also includes information on adaptation needs and potential interventions that are available. • The process for onboarding smaller, innovative suppliers is smooth and easy.
<p>4. Embed quality monitoring and reporting</p> <p>Good monitoring and reporting is important to knowing how successful previous decisions have been and will support learning and future decision-making.</p> <p>This is about being able to make quality procurement decisions and to follow them up and share this with others who may want to learn from the organisation's decisions and choices.</p>	<ul style="list-style-type: none"> • There are specific, measurable, ambitious, realistic and timely goals for the hospital's adaptation purchases. • The hospital's standard procurement terms and conditions promote the hospital's adaptation strategy. • Contract specifications in relation to adaptation are clear and publicly available, using existing standards, where possible, relevant and rational. • Monitoring and maintenance reporting requirements (both internal and for funders) are clearly understood and articulated in supply contracts. • Monitoring of contracts for upholding contractual obligations (specifically in relation to adaptation standards) and holding poor performance to account.

The key basic elements for creating an adaptation-positive procurement environment include having a sustainable procurement strategy in place, involving the right people at the right time in procurement discussions and decision-making, and knowing how to gain assurance by asking the right questions throughout the procurement process.

A Sustainable Procurement Strategy

The principles outlined above need to be supported by a procurement strategy which is shared with suppliers, and which clearly addresses the organisations plans to adapt to climate change. It should make clear how the healthcare organisation's procurement process is designed to influence how procurement gets done, in order to achieve the stated sustainability and adaptation goals and

priorities. It should demonstrate the healthcare organisation's management commitment to making procurement decisions which prioritise long-term sustainability and adaptation goals over short-term cost comparisons. As noted in the earlier section on Sustainability in Procurement, climate adaptation should be a clear goal within a Strategy for Sustainable Procurement, rather than requiring anything standalone.

Implementing a sustainable procurement strategy can be beneficial (adapted from³⁰):

- Efficiency – save time and money by wasting fewer resources over the life of a product.
- Contribute to better employee, patient and visitor health – by reducing toxins, and creating a safer and healthier environment and community.
- Improved value from suppliers – fostering innovation and a better end result through better engagement and contract management with suppliers.
- Attract and retain staff who are motivated by organisations who look after their environment, people and who are prepared for adversity.
- Better decision-making process and structures by incorporating a full range of considerations (e.g. social value) into procurement decisions, not just upfront costs and finance managers.
- Attract and secure resources to make change - be in a better position to secure advantageous funding when it becomes available.
- Position the healthcare organisation as a sustainability and climate change leader – attracting future staff, resources, collaborations, patients.
- Link the healthcare organisation's activities to the wider sustainability and climate change policy landscape, climate change goals global activities around sustainable development.

A strategy and associated policies for sustainable procurement (which includes adaptation) may include the following information:

- The organisation's aim for sustainable procurement (specific mention of climate adaptation) and how this links to wider policy landscape.
- How procurement decision making will be made to support sustainable procurement - e.g. what factors to account for in decision making and what weight is associated with each priority.
- How procurement governance within the organisation will be structured to involve the right people, so that it is inclusive, involves multiple perspectives and holds decision makers and suppliers to account for sustainability objectives.
- How the organisation intends to engage with the supplier community to support sustainability.
- Whether the organisation is aiming to achieve sustainability or climate related certification.
- General requirements for all procurement tenders and contracts which support sustainable (and adaptation) procurement.
- General requirements for selecting a product and for selecting a supplier.
- Suggested criteria to include in standard contracts to help consistent contract management
- Suggested monitoring and reporting criteria.
- An overall timeline of action for implementing the approach within the organisation.

Involving the right people in procurement decisions

The organisation should involve an appropriate range of expertise in the procurement and delivery process in a collaborative way:

- *Procurement professionals* who are trained in relevant procurement rules and regulation, and have an in depth understanding of the organisation's procurement strategy and how it relates to and supports climate adaptation.
- *Technical specialists* including climate adaptation, estates and engineering, finance, and risk management specialists. This will ensure that novel solutions and new suppliers are explored, that whole life costs to address systematic risks from climate change are accounted for in the procured solution and that the solution is technically effective and feasible.
- *Senior managers* need to be involved not only to ensure the choices made reflect the organisation's values and strategic priorities for climate adaptation, but also to ensure senior management understand the specific challenges of adaptation procurement.
- *Staff, patient and visitor representatives* need to be involved to ensure that the

views of those groups using the site are reflected in the choices made, as they will be directly impacted by the outputs and outcomes of the project(s).

- *[Potential and existing] Suppliers* should be involved in discussions to ensure they are primed to deliver products that meet the needs of the healthcare organisation (aligned to strategic objectives) and that the healthcare organisation is aware of the market's development needs ahead of going to tender.

Seeking assurance

Making good procurement decisions is about making sure they are aligned to a coherent strategy (e.g. they are consistently building towards the same goal), involve the right people (e.g. incorporating all relevant perspectives) and involve asking the right questions. [Appendix B: Questions to ask for assurance when making procurement decisions](#) is provided to assist in this regard. The question sets in [Appendix B: Questions to ask for assurance when making procurement decisions support adaptation](#) are provided to help organisations seek assurance that what is being procured or invested in, will support the adaptation of the healthcare organisation.

3.2.2 Understanding the adaptation requirement

The following principles (in Table 3) acknowledge that healthcare systems are complex and interconnected, as are the risks

that affect them. Making decisions that support climate resilience (mitigation and adaptation) means incorporating analysis of risks and intervention options.

Table 3: Principles 5-8: Understanding the Adaptation Requirement

Principle		Demonstrate this principle has been embedded by:
5.	<p>Account for multiple risks</p> <p>Are multiple risks addressed with the product/asset?</p> <p>This is about considering adaptation measures which might be able to address multiple risks, not just single risks.</p> <p>Where possible procure assets that consider the different ways in which the climate has or will change (increased heat, cold, storms, flash floods, high winds).</p>	<ul style="list-style-type: none"> • Undertaking analysis to understand how and where climate risks layer on top of one another (e.g. at the healthcare organisation's site are some areas consistently impacted by overheating in heatwaves, and flooding?). • Considering how a product performs under multiple risk scenarios (e.g. does it respond well in heat and high wind scenarios?). • Being willing to spend more (e.g. higher thresholds) on a product which addresses multiple risks.
6.	<p>Account for interconnectivity</p> <p>How will this asset work effectively as part of a network of assets, processes, people and risks?</p> <p>This principle is about trying to approach the selection and procurement of multiple adaptation measures in a way which complements one another. In this approach, the sum is greater than the respective parts, because they interact with one another and are procured with this in mind, rather than being procured in a piecemeal fashion.</p>	<ul style="list-style-type: none"> • Multiple adaptation interventions have been considered in the design and positively support each other. • Analysis involved understanding how climate risks could exacerbate one another, and which locations/people/processes are most 'at risk' as a result
7.	<p>Avoid maladaptation</p> <p>Is the intervention likely to create other adaptation risks or new harms elsewhere?</p> <p>This is about not procuring an adaptation intervention which unintentionally (or otherwise) creates other risks elsewhere, or moves an existing risk to another uncontrolled location.</p> <p>Addressing one physical climate risk should not contribute to poorer outcomes for other climate risks (e.g. moving the ICU out of a flood risk zone on the ground floor and into a heat risk zone on an upper floor).</p> <p>Controlling one risk through procuring adaptation products, should not unfairly impact another group – who or what is impacted by this choice?</p>	<ul style="list-style-type: none"> • The positive and negative impact of the intervention on the hospital's people, processes, resources etc is understood – beyond its immediate purchase rationale. • Selection and screening involves checking that there are no unmanaged/ uncontrolled additional risks caused by the intervention.

8.	<p>Avoid adding to emissions</p> <p>Is the intervention contributing to additional greenhouse gas emissions?</p> <p>This principle is about ensuring that an item procured for adaptation does not contribute to climate change, as this would exacerbate the need for adaptation at a later date. An example of this would be to deal with increased temperatures in hospitals only by installing more air conditioning units – thus increasing energy usage and contributing to increased GHG emissions. Think not only about the initial asset but also any resources, maintenance and spares needed for the asset over its lifetime.</p>	<ul style="list-style-type: none"> • Selection and screening involves checking if there are additional emissions – for the life of the good/asset, including servicing, maintenance, spare parts and consumables. • Preferential treatment for product which involves reuse of materials and support the circular economy.
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3.2.3 Procure products for the future

The principles in Table 4 all involve thinking about the procurement of goods and services

which are suitable for our future climate, economy and operating environment.

Table 4: Principles 9-12: Procure Products for the Future

Principle		Demonstrate this principle has been embedded by:
9.	<p>Procure products for the future operational environment</p> <p>What is the climate going to be like for the lifetime of the asset?</p> <p>This is about accounting for not only the whole life of the intended project, but also the physical environment the good or service will be operating in and the consequences of that on how it is operated. This may differ from current approaches which may value cost savings over a short period of time or assume a consistent environment throughout the lifetime of the procured item.</p>	<ul style="list-style-type: none"> • Undertaking analysis to understand different climate change scenarios and their impact on hospital infrastructures and services over different timeframes. • Choosing to invest in products designed to accommodate different kinds of climate over time – not just a constant operating environment. • Choosing to invest in products which are suitable for the climate throughout the life of the asset/intervention.
10.	<p>Procure products for future configurations</p> <p>Can the asset / contract be used in different ways - is it adaptable to the future environments it might be operating in or the ways services might need to be configured in the future? This is about choosing products which are flexible to perform in a variety of ways, circumstances and locations, so that they can suit a changing environment. Hospitals might need to change how they work, slowly over time or rapidly in an extreme weather event.</p>	<ul style="list-style-type: none"> • Selection considers how the product would be set up and configured in the current/future environment. Can it be used in different ways? Reconfigured for different locations? Used for different purposes? Is it modular? Are there multiple suppliers or spare parts? Is it easily adapted? • Procurement criteria favour solutions which incorporate flexibility – e.g. modularity, universal spares, non-proprietary systems, easily reconfigured.

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		<ul style="list-style-type: none"> Contracts are designed to allow adjustments so advantages from new developments and technologies can be realised by the hospital.
11.	<p>Procure for the future supply chain environment</p> <p>Is the organisation's supply chain and maintenance schedule also adapted to the changing climate?</p> <p>This principle is also about ensuring that for the life of the asset, it is suppliable and maintainable. Are there multiple organisations that could maintain this asset? Does the asset require spare parts which will become obsolete or difficult to procure in coming years?</p>	<ul style="list-style-type: none"> Choosing a product which is easily maintainable and repairable over its life time. Maintenance is possible by multiple non-proprietary maintenance organisations. Choosing products which are unlikely to be affected by foreseeable changes in the supply chain landscape (e.g. climate changes making key resources difficult to procure or legislative changes to limit the use of GHG emitting resources). Encouraging repairing rather than replacing parts to limit resource intensity, through procurement criteria specification. Favouring suppliers who demonstrate good business continuity practice and adaptation/resilience practices in the procurement process.
12.	<p>Account for full costs and opportunities</p> <p>Are the whole life costs/opportunities of the asset being accounted for in cost-benefit-analysis?</p> <p>This principle is about taking into account the <u>full life-time costs and benefits</u> of operating an asset, not just the immediate costs of set up and installation. This principle also invites consideration of different types of cost and benefits – not just financial costs, but time savings and the social value chains produced by the asset. It means accounting for the ongoing costs of maintaining and operating the asset including capital and operational expenditure.</p>	<ul style="list-style-type: none"> Allocating sufficient time during procurement for appropriate risk analysis, options analysis, market evaluation, securing appropriate funding and planning adaptation procurements Undertaking analysis of the <u>full life-time costs</u> including installation, maintenance and potentially decommissioning. Including <u>costs avoided</u> in any cost-benefit analysis (e.g. reduced premiums, minimal maintenance requirements, ease of repair, no additional future upgrade costs) in relation to changing climate. Including <u>primary and secondary benefits</u> in cost-benefit analysis. Considering positive and negative impacts of the intervention from a social value, economic and environmental perspective, not just the immediate financial costs.

4 Incorporating Adaptation Analysis into Procurement Decisions

Before making any procurement decisions that enable improvements in adaptation, the healthcare organisation must have a robust understanding of the kinds of risks it faces, who and what may be impacted by those risks (how, where and when), how any intervention would support the wider context of climate change adaptation for that facility, the specific costs and costs saved/benefits of any appropriate interventions and the funding landscape for the intervention chosen. Four aspects are summarised in Figure 4.

Analysis activity should enable the healthcare organisation to enter the procurement process with specific funding and financing mechanisms in mind, to secure specific and appropriate interventions for their risk profile and the services they intend to provide now and into the future. Incorporating this kind of

analysis and information into procurement decisions should support the healthcare organisation to meet their defined climate mitigation and climate adaptation goals.

Identification of an appropriate solution (e.g. the right intervention provided by the right supplier) involves incorporating risk analysis, policy landscape analysis and cost-benefit analysis in order to make a decision about the best intervention. It may be possible to determine the right intervention before going to market to find the right supplier. In other cases, because of the changing market in climate adaptation solutions, it might be necessary to have closer engagement with suppliers about what the hospital wants to achieve, as a collective development of the appropriate solution might be needed.

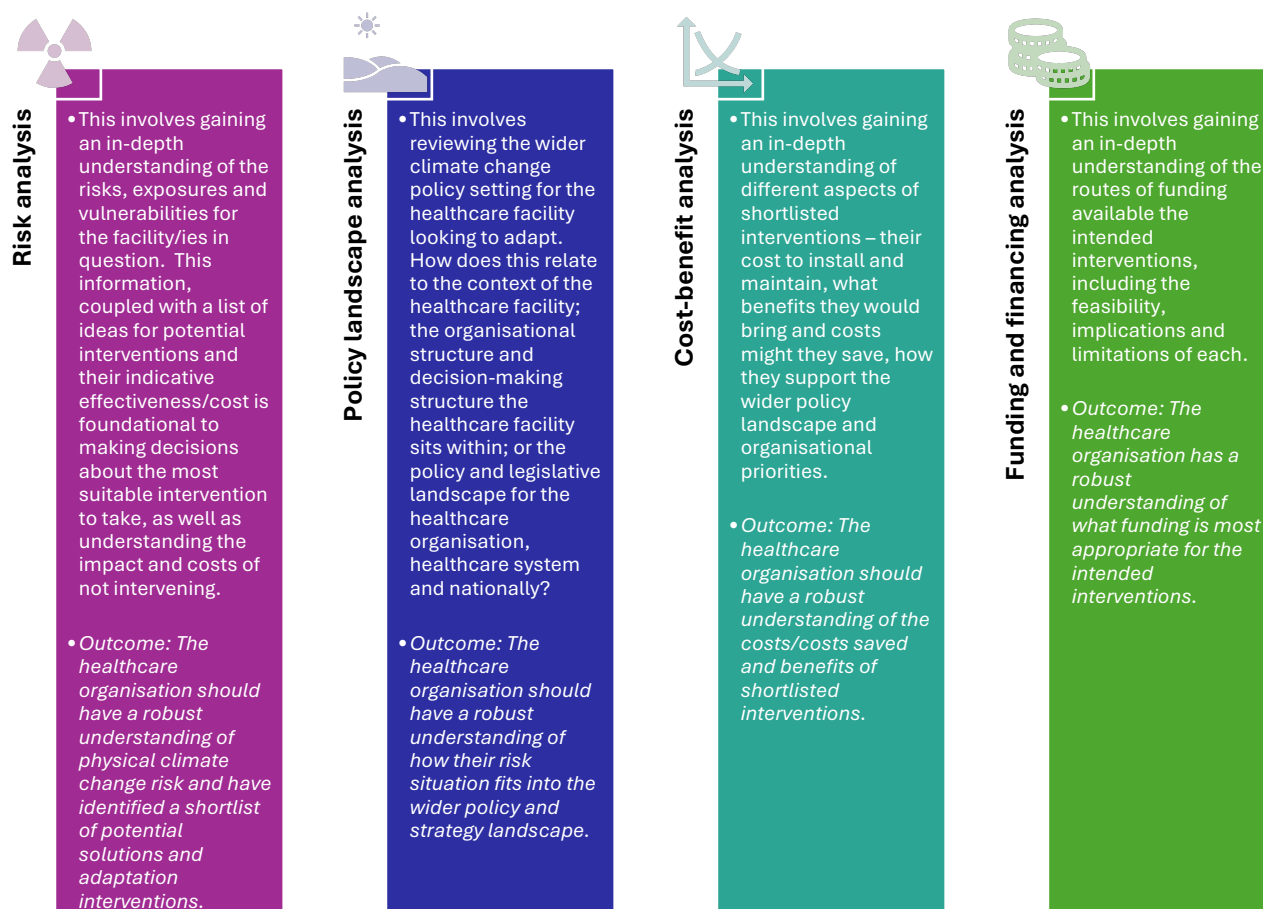


Figure 4: Analysis to include in procurement decision-making

4.1 Risk Analysis

Risk is created at the intersection of hazards (something with the potential to cause harm), exposure (the extent to which an organisation or process has the potential to experience that harm) and vulnerability (the propensity of the organisation or process to be susceptible to the harm), as visualised in Figure 5 (adapted from European Environment Agency³ and IPCC³⁷). Climate risks have the potential to cause a range of direct impacts and secondary consequences on the health sector and these are summarised in [Appendix C: Healthcare Climate Risk and Consequences Flow Chart](#). Assessing hazards, exposure and vulnerabilities

can help healthcare identify which climate-related threats and hazards are relevant to specific healthcare entities, and most importantly, the consequence of these on critical assets and prioritised activities. Figure 5 shows how the climate adaptation interventions work to reduce vulnerabilities and exposures, or the resulting impacts of the climate hazard event.

The Life Resystal Project is developing a climate resilience toolkit which is intended to assist local healthcare facilities understand and make investment and adaptation decisions based on climate risks relevant to their sites and the

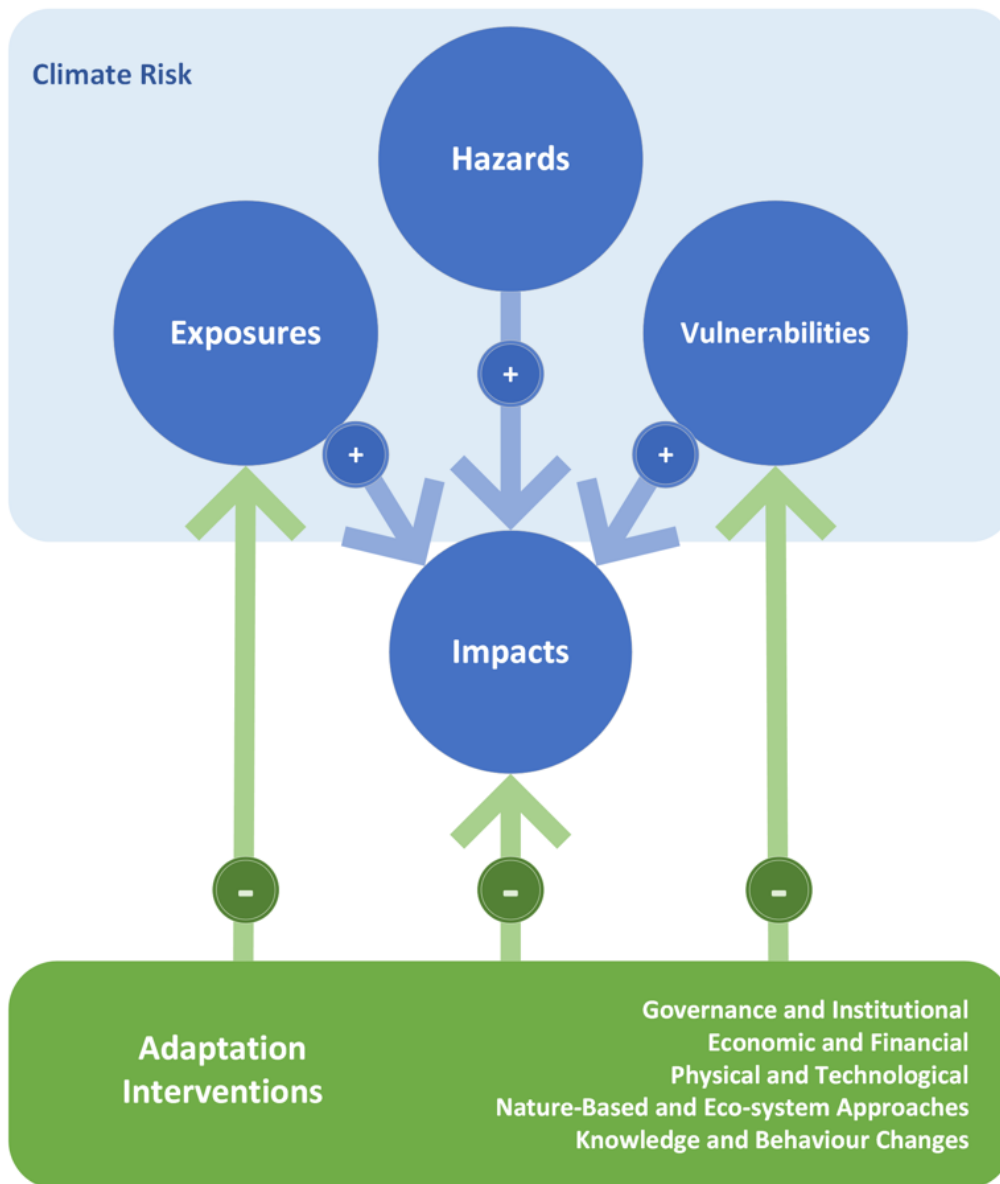


Figure 5: Components of Climate Risk and Adaptation.

impact of those risks on the services and people working and visiting them.

Linking healthcare organisation procurement decisions to climate adaptation requires understanding the interactions between risks, which lead to poor impacts on hospital services, staff and infrastructure, and how

interventions can be targeted to reduce either the exposure to the hazard, the vulnerabilities that make the organisation more predisposed to negative impacts and the impacts themselves. Table 5: Risk as the interaction between a hazard, exposure to the hazard and vulnerability articulates the three main elements of risk in the context of a healthcare setting.

Table 5: Risk as the interaction between a hazard, exposure to the hazard and vulnerability

Risk Aspect	Relevance to a healthcare organisation
<p>Hazard</p> <p>Physical climate-related hazards have the potential to cause harm or damage physically to healthcare operations and facilities by damaging, disrupt or degrade health-care assets and activities.</p>	<p>A healthcare organisation should know what physical climate hazards are relevant to the sites it is responsible for. Physical climate hazards relevant in the European Health Sector include:</p> <ul style="list-style-type: none"> • Extreme heat / cold (duration as well as temperature) • Flooding (surface water, river/ocean flooding) • High impact storms (extreme wind and rain) • Air quality issues • Wildfires • Drought/water scarcity
<p>Exposure</p> <p>Exposure is about where impacts of hazards are going to be felt.</p>	<p>A healthcare organisation should be able to identify exposure of their site and facilities by thinking about:</p> <ul style="list-style-type: none"> • Key geographical locations which might be affected by the physical climate hazard, i.e. where on site is going to be affected by the flooding or heatwave? • Critical assets and their linked networks that are likely to be affected, i.e. what infrastructure and assets might be most damaged or disrupted during extreme wind and storms? • Which activities might be impacted, i.e. which services and departments are in the areas most likely to be impacted?
<p>Vulnerability</p> <p>Some places and services will be more susceptible to being disrupted or harmed by the hazard – they are predisposed to be more impacted by the service provided, the people who are being cared for or the sensitivity of the healthcare equipment.</p>	<p>A healthcare organisation should be able to identify assets and services in at risk locations are. Some services or assets might be particularly sensitive to disruption or damage, e.g.:</p> <ul style="list-style-type: none"> • Emergency Department is a 24-hour service with no down time and unplanned admissions. • Some research departments might use very specialised equipment which cannot be easily replaced. • Some services can easily be moved to a new location, or delivered in more than one way.

Having a solid understanding of risk in the early phases of design and procurement in infrastructure and structural adaptation can reduce materialised risks later on^{22(p14)}. Ensuring the results of risk assessments in the procurement process should enable decision makers have a robust understanding of the kinds of hazards which might cause damage or disruption to the physical infrastructure of the

healthcare facility, as well as an understanding of how the hazards might affect specific parts of building, as well as people, assets and activities within those areas.

As depicted in Figure 5, adaptation interventions can work to increase a hospital's climate resilience by reducing exposure, vulnerability or impact. Interventions which relate to hospital infrastructures are more likely

to influence exposure and vulnerability. Other kinds of interventions for climate change adaptation which relate to knowledge and behaviour change might be more likely to

reduce the impact. More detail is provided in Table 6.

Table 6: Table showing how adaptation interventions can work predominantly to reduce exposure or vulnerability.

Action	Description	Healthcare example
Reducing exposure	<p>Healthcare organisations can change the extent to which locations, populations and services are exposed to the hazard by moving or relocating altering the services, assets or populations away from hazardous locations. This tends to be in the form of <i>re-location or reorganisation</i>.</p> <p>Relocation of an asset, population or process away from a hazard may not always be an option at all, because of the associated processes or infrastructures entwined with the service, or population affected. In addition, relocation might only be temporarily possible, rather than a viable ongoing or long-term solution. This is important to note in relation to changes in the climate which will become more of the ‘norm’ rather than exceptional emergency situations.</p>	<p>Surface-water flooding from flash rain downpours is a risk to a ground floor location which houses the ICU, the hospital could consider options which <u>remove or relocate the hazard</u> (e.g. increase storm water system capacity, redirect water courses etc) or they could <u>relocate the at-risk department, service, asset or population</u> to another part of the hospital outside the at-risk area. This would therefore be changing the exposure to the hazard.</p>
		<p>ICUs are connected to lots of other departments, medical resources, clinical devices and clinical pathways which mean moving involves recalibrating all of those other connections. This recalibration may be more burdensome than removing the hazard in the short term. Conversely, major reorganisation of a hospital might offer an opportunity to improve patient and resource flows through the hospital, particularly in the long-term.</p>
Reducing vulnerability	<p>If moving the hazard or relocating the at-risk asset, service or population is not possible, healthcare organisations can instead look to protect services, populations or assets exposed to a hazard, so that they are less susceptible to impact from the hazard. Protection tends to come in the form of a physical barrier or counteracting or reducing the consequences.</p>	<p>In the ICU, flood barriers could be installed to limit the amount of water coming into the facility, surfaces could be made water resistant, and materials could be used which mean clear up is quicker. Elsewhere if hospital theatres were at risk from overheating during a heatwave, the hospital could increase capacity of air conditioning units or improving natural ventilation. The higher temperatures would still be an issue, but the at-risk services, assets and patients would be protected from these effects (other parts of the hospital might not be).</p>

4.2 Policy Landscape Analysis

In order to make a decision on the most suitable intervention the healthcare organisation will need to understand not only about the wider policy landscape for climate adaptation for their situation, but also to understand more concretely, what the implications of could be for choosing to implement one or more of the preferred interventions.

A critical part of the journey towards making an appropriate intervention to adapt to climate change is to ensure that the healthcare organisation’s plans align with the legal and policy landscape it operates within. Any of these documents, policies and commitments has the potential to limit or steer the choices and options for adaptation interventions. The

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Figure 6: Visualisation of the legal and policy landscape for healthcare climate adaptation

legal and policy landscape is made up of various levels depicted in Figure 6 on the next page.

A selection of common policy documents at each level is provided in *Appendix D: Policy Landscape Aspects to Consider*, noting that these will differ by country and the facility's specific context, so part of this activity is getting to know what is available and what is important for the healthcare organisation's adaptation/infrastructure project.

At an international level, there are a range of agreements and policy documents which steer behaviour and support the response to climate change through mitigation and adaptation. These key agreements and targets are the backbone of international efforts to respond to climate change risks. There are also a range of international standards which support the consistent application and approach to different aspects of climate change (See *Appendix E: International Standards*).

At a national level each European country may have its own national legislation, national adaptation plan and associated commitments and national policies supporting adaptation. These are often written as part of a commitment at an international level (e.g. if the healthcare organisation's country of operation is a signatory of the Paris Agreement). Depending

on the political and decision-making structures in the country where the healthcare organisation is operating, there may be other regional or sub-national policies which are also relevant. This is particularly relevant to EU member states, where there are commitments to EU-level policies not only on adaptation but also procurement mechanisms. At a regional level, some countries have partly or wholly devolved authority for healthcare management to regional authorities.

The healthcare landscape will be informed by the main model for healthcare provision within the country and the healthcare organisation's situation relative to that (e.g. it could be a private healthcare provider but operating in a country with a national health service model).

- The private insurance model – the least state involvement in direct funding or provision of health services. Citizens must make regular payments to a health insurance company for cover (e.g. USA)
- The social insurance model – healthcare is funded from workplaces, through compulsory payments by workers and employers into non-profit insurance funds (e.g. France, Germany and much of Central and Eastern Europe)

- The national health service model – universal coverage, access to comprehensive services without charges, fully funded through general taxation (e.g. UK, New Zealand, Scandinavia, Italy and Spain).

Each country in Europe is responsible for managing healthcare provision directly, including members of the EU, although the EU offers a range of additional joined up policies which states can support the adaptation agenda. At a sector level there may be guidance and policies which supports healthcare adaptation to climate change. Because each healthcare system is different, there may be additional guidance and policy set at organisation level. Each health facility will be run by a specific healthcare organisation – these may operate across the whole country or even internationally. They may only operate facilities in particular locality or have a specialist focus

(hence particular risk profile). This overarching organisation, whether national, regional or local may have in place organisation-specific commitments to climate change, potentially with a focus on adaptation. Some countries manage healthcare from a regional perspective. At a facility level there may be local pledges and initiatives in place to support climate adaptation locally. This is particularly likely if the facility has experienced risks posed by climate change – e.g. recent floods or heatwaves.

All of these aspects of influence, direction and support mean that the healthcare adaptation landscape may look quite different for each healthcare organisation. Identifying and reviewing relevant adaptation plans, commitments, priorities and policies will help determine what the policy landscape is for the healthcare organisation in question and if done well may lead to the benefits outlined in Table 7 below.

Table 7: Table of the benefits of reviewing the contextual landscape

Benefit Sought	Information Required
Any proposed adaptation measures must align to the relevant legal and policy landscape at national, sectoral, organisational and local level.	Highlight any legal restrictions or parameters to what the healthcare organisation wants to achieve and how it wants to achieve it. Highlight any focus areas and priorities at a national, sectoral or organisational level in terms of policies or objectives not only for climate adaptation but also for other social and environmental aspects – these can be used to hook into and made a business case later-on.
It should enable smoother access to funding opportunities.	Highlight opportunities for and routes to relevant funding may be identified during the legal and policy review process. Make securing funding for interventions easier as there should be a clearer business case from a legal and policy perspective. The healthcare organisation will be able to link what it is trying to do, to current focus and priorities at different levels.
It will provide an increased understanding of the organisations and stakeholders operating in this space.	Highlight who are the key actors are, what are their objectives, why might the healthcare organisation need to engage with them, how can the healthcare organisation engage with them successfully – what drives them? This information will help the healthcare organisation work well and effectively with a variety of partners over the project lifetime.
It will provide better understanding of the reporting requirements for climate change interventions.	Highlight what reporting looks like for different partners. How is success being measured, when to report, what kind of information is needed. By finding this out, the healthcare organisation can start to build reporting into the project from the outset.

4.3 Cost and Benefit Analysis

The healthcare organisation should now have a robust understanding of the kinds of hazards which might cause damage or disruption to the physical infrastructure of its healthcare facility, as well as an understanding of how the hazards might affect specific parts of buildings, people, assets and activities within those areas. The healthcare organisation should also have an idea about potential interventions it could implement to reduce the impact of the hazard on the healthcare organisation's facility/activities. Each of these potential interventions is different with its own unique set of benefits and drawbacks. It is important to understand the costs and benefits of any intervention under consideration. Not only will this information be required in order to make the best decision about which intervention to choose, finance teams, senior management and potential funders will need to be provided with this information to convince them that this intervention is needed, is the best option given alternatives and that it makes good financial, social and environmental sense.

Healthcare infrastructure assets often have a long lifetime (in some cases 50 years or more). They are frequently associated with high upfront costs and limited flexibility once in place. From an adaptation perspective it is imperative when comparing different interventions, to consider the operating environment of these assets and the changing risks to its operability **over their respective lifetimes**, whether undertaking a new build or a retrofit. Not all adaptation

4.4 Funding and Financing Analysis

An intervention needs to be viable given the healthcare organisation's situation and context and at the same time it also needs to be fundable; an un-fundable or un-financeable solution is not implementable.

The funding and financing landscape for climate change adaptation is complex and varied (see Green Box 1 on the next page for a useful reference document from Schatalek and Bird³⁸). There is no one-size-fits-all funding solution and solution will depend on the kind of interventions the facility intends to make. An organisation may have access to internal sources of funding

interventions will involve large scale infrastructure projects, some projects may be more modest in nature.

Decisions relating to infrastructure investment may fail to incorporate realistic information about future climate conditions into analyses of the different options. However, climate modelling data is constantly being updated as new advances in scientific understanding of climate projections is refined. This means that decisions may need to be taken with the best currently available data, accepting that older models may have greater uncertainty associated with them. Investment decisions often also overlook spending on resilience, because it is viewed as not cost effective, to increase costs and lengthen implementation schedules. This means that making changes which incorporate adaptation can be seen as 'irrational' in comparison with other options for improving a facility, but which do not address future risk. The private sector is rarely incentivised to make decisions that optimise costs throughout an asset life while incorporating climate risks^{22(p15)}. Using a methodology like PCRAM²² may be useful as this incorporates modelling not only about the potential **costs incurred** to implement the adaptation, but also the **costs saved** over the lifetime of the asset and against evidence-based climate scenarios. This can be much more effective than making decisions about the future based on current or historical data.

through capital expenditure budgets or fund-raising activities (such as levies or charges, although this is less common in healthcare settings). External instruments for funding adaptation can be categorised into one of three types: debt, equity and grants²:

- **Debt:** Financing adaptation through taking on debt means that money is provided by an external lender, such as a bank or fund, and it requires repayment, normally (but not always) with interest on top of the original amount borrowed. Examples include loans and bonds.

- **Equity:** Equity finance refers to receiving funds in exchange for part ownership of the organisation seeking the finance. An example of this is selling shares to investors. This may not be an option for all organisations (particularly in healthcare) if they cannot give up a stake in the organisation to another party.
- **Grants:** Grant money does not require repayment. This might be through charitable giving or government grants for example.

Many, but not all, countries have made a commitment to health in their plans and commitments submitted to the UNFCCC under the Paris Agreement. Countries that have specifically included health in their NDCs (see [Policy Landscape Analysis](#)) tend to be clustered in the low and middle-income countries³⁹. Whilst half of the countries surveyed had health adaptation measures set out in National Adaptation Plans (NAPs) or strategies, only a quarter were able to achieve implementation to any significant degree, with funding and financing the greatest barrier to implementation⁴⁰. Most major ‘health-related’ funding at a bilateral or multilateral level is provided for projects for which there are only secondary benefits for health; health is less frequently the major focus of such funding^{41–44}. Climate change mitigation activities receive significantly more public funding than do adaptation activities^{45–47} and of adaptation funding only a fraction is allocated to health^{43,48}.

Historically it is believed that low demand at country-level for health sector climate change adaptation finance is the result of a focus on other sectors (such as agriculture and energy), poor information regarding financing opportunities, and no obvious immediate economic benefits from healthcare CCA spending^{40,49}. EU countries—typically classed as middle to high income within UN funding structures for climate change—are most likely to rely on out of pocket spending (middle income) and government and prepaid private spending (high income)⁵⁰. These countries are unlikely to be able to benefit from the main financial mechanisms operating through the UN to fund adaptation.

Resources / Actions

For a good short overview of the basics of Climate Finance check out these handy ‘**Climate Finance Fundamentals**’ guides produced by the ODI and Heinrich Boell Institute (available in ENG, FRA, ESP):

<https://climatefundsupdate.org/about-climate-finance/climate-finance-fundamentals/>

1: The Principles and Criteria of Public Climate Finance: A Normative Framework

This Brief looks at principles and criteria applicable to the mobilization, administration, governance, disbursement, and utilization of climate change funding.

Estimates suggest that overall there is a relatively even spread between public and private financing for all climate change interventions⁵¹. Nevertheless, investors and lenders can require high levels of assurance that they will make their original investment back before choosing to fund an adaptation project. Whilst some research⁵¹ suggests that adaptation efforts are predominantly privately financed, through taking on debt, other sources suggest that to date there has been minimal private investment into adaptation projects. This is thought to be in part due to the difficulty in generating sufficient revenue flows from projects and making it an attractive offer to an investor looking for a return, as it can be difficult to monetise the benefits of adaptation action to repay private investment⁵².

Additional barriers to new investment in climate change include: limited climate risk information and measurement indicators; lack of bankability of climate adaptation projects; and policy, regulatory and behavioural barriers⁵³. Green finance is an area which is continuing to evolve out of the push for investment opportunities which incorporate environmental, social, and governance aspects in the projects that are funded – so called Green or ‘ESG’ investments. However, there are different interpretations of what counts as ‘Green’ and which aspects are important for ESG reporting. Securing private funding for a project will in any case require a solid business case in order to convince lenders that they are

making a sensible investment and will get their money back.

Different kinds of funding organisations

Money to fund climate change interventions flows through various channels, both within and outside of the UNFCCC and Paris Agreement financial mechanisms. Increasingly money comes through bilateral, as well as regional and national climate change channels and funds. It is a complicated and evolving picture (2 helpful and recent overviews are available^{54,55}).

- **Development Finance Institutions (DFIs)** are specialist development banks or subsidiaries set up to support private sector development in developing countries. They are usually majority-owned by national governments and source their capital from national or international development funds or benefit from government guarantees. This ensures their creditworthiness, which enables them to raise large amounts of money on international capital markets and provide financing on very competitive terms.
- **Multilateral DFIs** are private sector arms of international financial institutions established by multiple countries, and therefore subject to international law. Their shareholders are generally national governments but may include other international or private institutions. They finance private sector projects mainly through equity investments, long-term loans and guarantees. They usually have a greater financing capacity than bilateral development banks and enable co-operation among governments. Multilateral funding represents core contributions from official (government) sources to multilateral agencies which use them to fund their own developmental programmes (e.g. Green Climate Fund (GCF), Global Environment Facility (GEF), Special Climate Change Fund (SCCF), Least Developed Countries Fund (LDCF)).
- **Bilateral DFIs** are either independent institutions, or part of larger bilateral development banks. Bilateral funding represents flows of funding from official (government) sources directly to a recipient

country. **National DFIs** on the other hand facilitate flows of funding from a DFI within the same country, where traditional lenders might be reluctant to lend.

- **Governments:** Central government and individual government departments may have specific programmes of funding in place to realise specific priorities set at a national or sectoral level, by direct funding capital projects.
- Institutional investors and private funding.
- **Public Private Partnership (PPP).** These are long-term contracts between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance (IDB, 2020). PPPs are gaining importance in many developing countries as a way to finance infrastructure assets. However, to date, the traditional risk allocation frameworks for PPPs include limited consideration for climate change risks. This failure to consider climate risks is further exacerbated by a lack of knowledge and appropriate incentive structures in dealing with adaptation and long-term resilience for infrastructure PPP arrangements.

Some key features of typical PPPs make them well-suited to incorporating climate resilience considerations, and financially attractive:

- **Consider life-cycle costs** – they are long-term contracts (typically 25-30-50 years) and this encourages greater discipline in procurement. Private organisations can be incentivised to think about future potential risks and costs. This should lead to better designs which take into account future climates.
- **Innovative solutions** – PPPs normally bring together different stakeholders in new combinations, which can lead to innovative solutions.
- **Due diligence** – because it involves private finance there is a lot of due diligence to make sure there is good

performance and that risks are mitigated (including climate).

- **Risk assessment** – PPPs involve evaluating and mitigating any risks which may disrupt the service.
- **Private benefactors and philanthropy.** These are individuals and groups who choose to provide grants to fund specific projects which align with their core objectives. The scale of funding can range from very small simple projects to large and complex ones. If only relatively small amounts of funding are required, this may be one of the most straight forward mechanisms for funding the project and there may not be long timescales involved or extensive work to write a bid for a grant, especially if the organisation is local and the offer of funding relatively informally structured. On the other hand, some schemes may be very competitive and require multiple steps before funding is allocated.

- **Healthcare corporations and capital spending programmes:** Healthcare organisations may release capital funding for healthcare projects which align to specific organisational objectives.

Having identified potential sources of funding available and with an understanding of their main constraints and features, the next step is to review the limitations and eligibility criteria for each against the adaptation project's requirements.

The remainder of this Procurement Guide is broken down into two chapters, the first (Chapter 5) is about incorporating pre-procurement analysis into procurement and investment decisions in a way which supports the wider adaptation goals of the organisation. Chapter 6 is about addressing key aspects of the procurement cycle and considering how these can be bolstered to be more adaptation friendly.

5 Incorporating Adaptation into Procurement Contracts and Processes

A decision to invest in a structural climate adaptation intervention means having to choose an appropriate intervention. A list of potential structural interventions is available in Watkiss and Ebi⁴⁹ and a brief overview is provided in Appendix F: Table of adaptation options. It is likely that any kind of structural intervention will be part of a pre-defined project put together by the healthcare organisation, and which suppliers bid to win, or suppliers will submit a project proposal to meet requirements of a tender.

European healthcare organisations within the EU will be subject to the practical application of contractual mechanisms that take into account the European directive on public procurement directive³¹, which covers tenders that are expected to be worth more than a given amount. The core principles of these directives are transparency, equal treatment, open competition, and sound procedural management. This means that healthcare organisations are required to establish procurement mechanisms (preparation and execution) for contracts for projects, works, general services or supplies of equipment or medical devices aimed at improving resilience. The way these contracts are processed and managed varies significantly depending on their typology (works, services or supplies). Analysis of the local policy and procurement landscape should identify what procurement procedural constraints are in place or will influence the specific way in which a particular intervention can be procured by a particular healthcare organisation. For example, the Procurement for Adaptation principle of introducing flexibility

into the contract in order to be able to incorporate innovation mechanisms throughout its life, might be difficult to adopt in an EU organisation, as all these procurement rules must be foreseen and well specified in advance.

Healthcare organisations can become aware of intervention solutions through existing knowledge (e.g. facilities and estates team already have some knowledge about sustainable drainage systems) or through new engagement with new/existing suppliers. Some healthcare organisations may also enter into Framework Agreements with suppliers. For example, NHS Commercial Solutions has just gone live with a new *Sustainable Estates Solutions* framework⁵⁶, which comprises a broad range of service lines which have been split into four categories (consultancy services, building remediation, power generation and storage, nature-based solutions) in order to support NHS organisations and the implementation of their Green Plans.

Including adaptation considerations within procurement decisions can also occur during specification, purchase, installation and maintenance of the intervention, and afterwards, through appropriate monitoring and reporting over the lifetime of the intervention (see Figure 7). By incorporating adaptation considerations into these activities, the healthcare organisation will have selected and implemented an intervention which addresses climate risk and which contributes to the body of evidence about interventions to enable other organisations to make informed choices about what might work well.

5.1 Procurement Specification

The healthcare organisation will need to set out the requirements: what is to be supplied, technical requirements and potentially supplier qualifications. Traditionally these specifications can be quite prescriptive and focus on outputs rather than outcomes. An adaptation-focused approach should ensure

that climate resilience expertise and advice underpin the project and is included in the design and implementation all projects (and particularly those specifically addressing a climate risk).

The organisation's climate adaptation intention should be evident in the specification of any

project (whether specifically procuring a climate adaptation intervention, or a more general project – e.g. refurbishing an old ward). Risk information from the initial analysis stage should inform project specifications. The project specifications should clearly state what information is available about the climate risk(s) being addressed, how success is being evaluated (what does adaptation look like and how will it be measured in the selection and monitoring stages), and required technical

requirements or thresholds (e.g. product certification, minimum capacity, acceptable temperature range etc.).

Any climate expertise and qualifications required as part of the project should be set out clearly in the contract documents and it should be clear how vendors can demonstrate their climate adaptation experience and relevant qualifications required (where this is needed).

5.2 Contract, Project and Programme Management

In complex programmes involving multiple projects with multiple contracts and suppliers, activity can easily become siloed and fragmented, meaning the different parts of the project work in isolation. Contract, project and programme design and management become increasingly factor in ensuring that the adaptation and resilience values built into the project continue to be attended to and are not lost along the way. It can be easy to neglect resilience goals if they are not managed long-term as these can be forgotten, misunderstood or deemed nonessential, particularly where multiple parties are involved.

The intervention project team will need to take a systemic approach to delivery (as noted earlier) and involve a range of stakeholders and kinds of expertise. All parties involved will need incentivising to ensure that adaptation is delivered throughout the lifetime of the intervention and will need to be encouraged to work collaboratively with other project partners to deliver adaptation. Organisational approaches to structuring project teams can help with this. Suggestions include combining multiple roles under one organisation, public private partnerships, joint ventures, outcomes-based contracts, alliance contracting, and the Project 13 ‘enterprise’ approach⁵⁷. All of these models of working together foster integrated

and collaborative relationships, with organisations incentivised to work towards long-term relationships and the delivery of longer-term goals.

Contract management requirements should of course be proportionate and relevant to the size and scale of the project. Some climate adaptation projects may be relatively small, and a complex formal structure may be heavy handed, unnecessary and counterproductive for the delivery of the adaptation goals and a burden on the parties involved. In all sizes of project however, a way to ensure adaptative change is delivered is to adopt performance-based procurement mechanisms which tie the remuneration of suppliers and contractors to their performance and the achievement of climate change resilience objectives. It is therefore important to choose suitable performance measures, otherwise partners may prioritise delivery of activities or products which do not address climate risk meaningfully.

The question sets in *Appendix B: Questions to ask for assurance when making procurement decisions* provides selected questions to ask to gain assurance on whether contract, project and programme management is being done in a way which supports the achievement of climate adaptation goals.

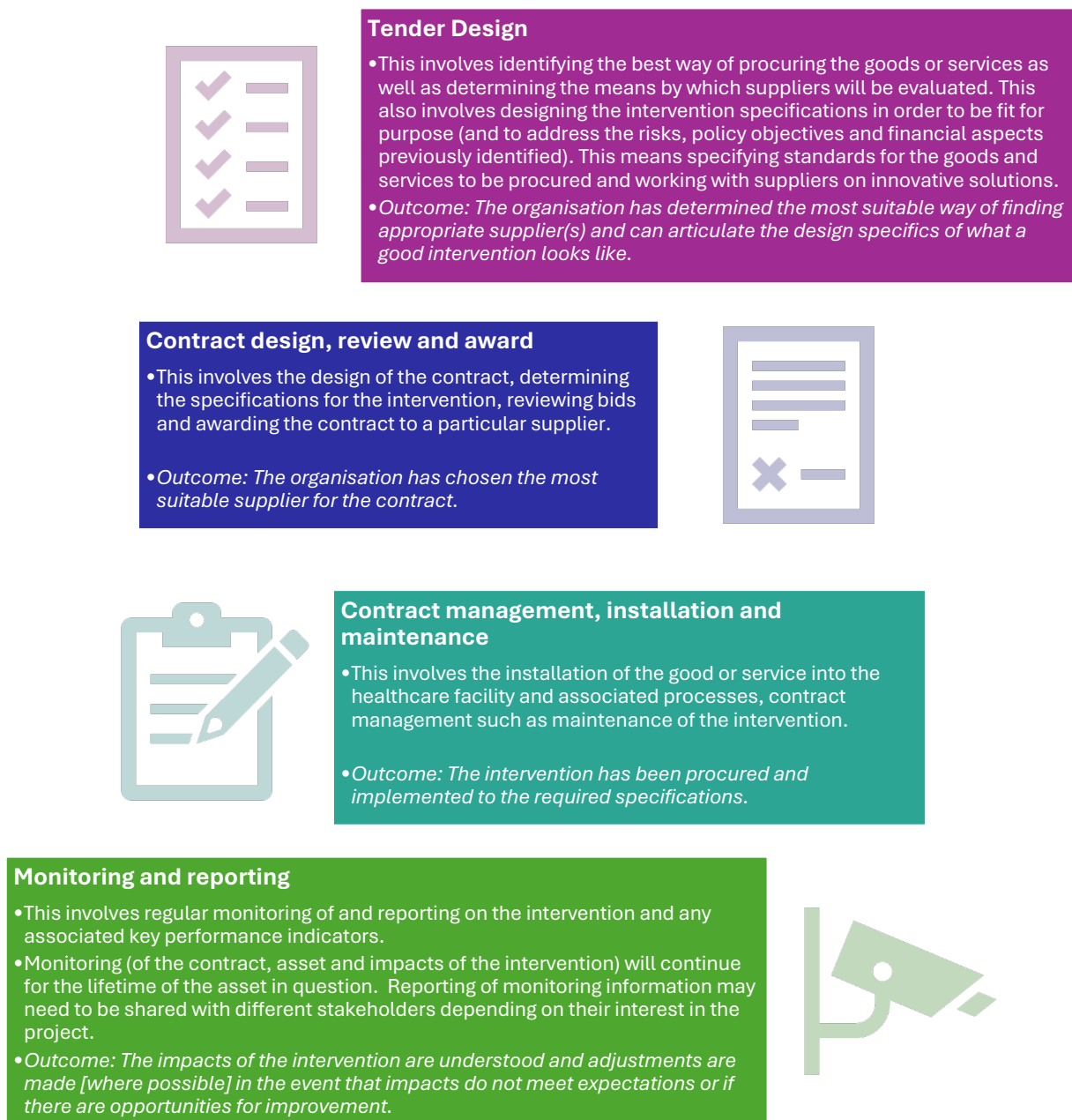


Figure 7: Incorporating adaptation considerations during the procurement process

5.3 Monitoring and Reporting

Recent academic research⁵⁸ has identified that reporting about completed infrastructure adaptation actions in the health sector is very poor. Not only are there a very limited number of cases available in academic and grey literature, but the level of detail of information about the reported cases often is very poor and the detail included is inconsistent. Healthcare facilities

are encouraged to report on adaptation interventions where possible. If there are no public inventories to submit cases to, we suggest including them in their organisation’s annual adaptation reports, as these are often published on public facing websites. Monitoring and reporting against climate change adaptation projects will be important at different stages of the intervention (see

therefore be shared with and meet the needs of different stakeholders.

Table 8). This monitoring and reporting will serve different purposes and the information may

Table 8: Table of monitoring and reporting activity

When	What for	Who for
During project delivery	Monitoring and reporting of progress will be used to inform the decision to remunerate suppliers for work completed and/or outcomes achieved. It will also ensure that the project is being delivered on time, to budget and meeting the stated adaptation objectives. It will also be used to keep track of adaptation interventions being taken to see what is being done.	Contractors and the project management team. Health sector adaptation reporting authority
Over the lifetime of the intervention	Monitoring and reporting will be used to determine the effectiveness of the adaptation in relation to the adaptation goals and changing climate. It will also be used to keep track of adaptation interventions that have been implemented as part of environmental and adaptation reporting requirements. It will also be used to inform future procurement and investment decisions – at the facility and also by other organisations looking for effective and good value interventions.	Risk management / Emergency management professionals Estate and facilities management National/ Health sector adaptation reporting authority
Over the lifetime of any funding and financing taken on to pay for the costs of adaptation	Monitoring and reporting will be used to account for money and financing of adaptation and how this relates to effective spending – making a business case for adaptation spending. It will also help investors understand the climate risks associated with their investments, how their investments can intervene to help organisations adapt and ultimately help direct finance towards adaptation. It will also be used to make financial decisions around how, or even if, money has been recouped (e.g. through reduced premiums).	Funding/financing body Other potential investors Healthcare organisation's finance department

Many organisations who want to make investment decisions about infrastructure adaptation would benefit from learning from other healthcare facilities not only about what has worked well and been successful, but also what has not worked well and why. This information will help them make better

informed decisions at their own organisations. At present very little information exists to help decision makers make good climate adaptation investment decisions. It is hoped that this document will support the move to an environment where lessons and information about climate adaptation are more freely accessible.

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Appendices

Appendix A: Key literature and references

To develop this guide, we reviewed and were influenced by various publicly available documents relevant to the issue of procurement for healthcare adaptation to climate change. Key documents are summarised briefly here, as readers may wish to refer in more detail to the documents as each has a different focus.

Document Image	Name and Overview
	<p>CIRDA (undated). Procurement Guidance</p> <p>GEF and UNDP’s Procurement Support Office and CIRDA [Programme on Climate Information for Resilient Development in Africa] Experts on Alternative Technologies factsheet to guide to partner countries in their efforts to procure new technologies. Developed for procurement specifically within the CIRDA programme within the GEF funding mechanism and not related to Europe or healthcare. It is one of the few documents we found to focus on the procurement process for adaptation interventions.</p> <p><i>Keywords: Information for adaptation procurement process, funding mechanism, African focus.</i>⁵⁹</p>
	<p>Chavarot, A. et al. - Coalition for Climate Resilient Investment and Mott MacDonald (2022). The Physical Climate Risk Assessment Methodology (PCRAM) Guidelines for Integrating Physical Climate Risks in Infrastructure Investment Appraisal</p> <p>By integrating climate science, asset management and engineering, as well as infrastructure finance, PCRAM provides a process by which to include physical risks into investment decision-making over the life cycle of an asset. It specifically covers costs incurred as well as costs saved over this period by repositioning physical risk as not only cost minimisation (for loss and damage) but as an opportunity for value creation. It is focused generally on large-scale civil engineering projects.</p> <p><i>Keywords: Major civil engineering focus, asset life time costs, adaptation, methodology.</i>²²</p>
	<p>European Commission - Expert Panel on effective ways of investing in Health (EXPH) (2021). Public Procurement in Healthcare Settings: Opinion of Expert Panel on effective ways of investing in Health (EXPH)</p> <p>The report identifies challenges in public procurement and potential solutions within healthcare systems. Based on cases for tendering of pharmaceuticals, health technology, and e-Health, it identifies challenges relating to the complexity of the procurement process, imbalances in power on either side of transactions, and the role of procurement in promoting broader public policy objectives. Recommendations are made for strengthening the procurement process, using procurement to promote the goals of the health system, and the interests of patients, to promote the wider social, economic, and environmental public policy goals, and building procurement skills and capacity within healthcare.</p> <p><i>Keywords: Healthcare, overcoming barriers, investing in health.</i>³³</p>

	<p>European Environment Agency (2023) Urban adaptation in Europe: what works?</p> <p>An in-depth 250-page report about urban adaptation in Europe, using Key Type Measure classification⁶⁰ – which changes the focus from hazard-specific approaches to approaches that emphasise the importance of building overall resilience. They breakdown measures into governance and institutional, economic and financial, physical and technological, nature-based solutions and ecosystem-based approaches, knowledge and behavioural change. The report highlights the urgent need to adapt European cities to climate change and provides an overview of actions they are taking. It provides a rich source of information to support climate adaptation policies across Europe, from EU to municipal level. Financial measures are discussed but not in a way which addresses procurement.</p> <p><i>Keywords: European focus, adaptation, intervention measures³</i></p>
	<p>Ewart et al. – Canadian Climate Institute (2023). Mobilizing private capital for climate adaptation infrastructure</p> <p>Despite a strong economic case for resilience, Canada faces considerable challenges to unlock private finance for public infrastructure projects. Frequently this is because the benefits of climate adaptation infrastructure cannot always be easily quantified, aggregated, and monetized in a way that creates the cash flows required for the private sector to invest. This paper explores these challenges and identifies potential solutions to align the financial case for adaptation investment with the myriad benefits it provides.</p> <p><i>Keywords: Canadian context, private finance, infrastructure, adaptation⁶¹</i></p>
	<p>Health Care Without Harm - Europe (2024). Quick Guide to Climate-Smart Procurement</p> <p>This guide shares examples of sustainable procurement in the European healthcare sector to encourage hospitals and healthcare systems in Europe to follow best practices in relation so sustainable procurement (mitigation is the focus rather than adaptation, however there is reference to improving the resilience of supply chains). The guide was designed for those positioned to influence healthcare’s carbon footprint through sustainable procurement practices: procurers, sustainability professionals, senior decision-makers working within healthcare facilities, and healthcare professionals.</p> <p><i>Keywords: European cases, healthcare focus, sustainable procurement (mitigation driver)⁶²</i> 14/01/2025 11:05:00</p>
	<p>Health Care Without Harm, Practice Greenhealth and Global Green and Healthy Hospitals (2020). Sustainable Procurement in Health Care Guide</p> <p>A ‘sustainable procurement guide’ which includes climate adaptation intervention procurement within healthcare systems. It includes information on the impact goals of sustainable procurement, the benefits / business case for buying sustainable goods and services, how to engage internal stakeholders and suppliers, how to build a best-in-class sustainable procurement program and challenges and solutions. This document was one of the most relevant to procurement in a healthcare setting (and has various checklists and detailed health-specific focus). However, adaptation to risks driven by or exacerbated by a change in climate are not recognised at all in the way that sustainability is described. The few mentions of climate change relate exclusively to mitigation actions such as energy saving and reducing</p>

	<p>emissions. It also lacks information about how to incorporate funding and financing considerations into the process of procurement.</p> <p><i>Keywords: Healthcare focus, sustainable procurement (without funding detail), toolkit.</i> ³⁰</p>
 <p>The diagram illustrates the 'Infrastructure Pathways' lifecycle, starting with 'POLICIES & PLANS' and 'INVESTIGATION', moving through 'FEASIBILITY & PREPARATION', 'DESIGN', 'PROCUREMENT', 'CONSTRUCTION', and 'OPERATION & MAINTENANCE', finally leading to 'END OF LIFE'. It also includes a legend for 'INFRASTRUCTURE' types: Energy, Water, Transport, and Buildings.</p>	<p>International Coalition for Sustainable Infrastructure, The Resilience Shift and Arup (2024). <i>Infrastructure Pathways</i></p> <p>The project aims to organize, explain and link key existing information, guidance, and tools from multiple sources on climate-resilient infrastructure across the infrastructure lifecycle, providing practical, mutually-reinforcing actions in each phase of infrastructure development, and creating a ‘golden thread’ across systems and practitioners. It is designed to foster more informed decision-making, improved coordination and better collective impact from practitioners across the infrastructure lifecycle to embed climate resilience into infrastructure. It is a platform, and, in time, a community of practice, for making climate resilience part of day-to-day practice.</p> <p>We found this to be an in-depth tool, which clearly integrates actions for incorporating resilience and adaptation along the whole infrastructure project. It has a module on procurement as well as one on funding and financing.</p> <p><i>Keywords: Sector agnostic, infrastructure and major civil engineering projects focused, different practitioner groups, toolkit</i>³⁴</p>
 <p>The cover features a collage of images related to infrastructure and climate resilience, including a person working on a field, a wind turbine, and a bridge. Logos for ABBEL, IDB, and other partners are visible at the bottom.</p>	<p>International Development Bank (IDB) (2020). <i>Climate Resilient Public Private Partnerships: A Toolkit for Decision Makers</i></p> <p>This Toolkit and the accompanying report “Improving Climate Resilience in Public Private Partnerships [PPPs] in Jamaica” are the result of an 18-month project between the IDB, the Development Bank of Jamaica and IMG Rebel. The aim is to provide PPP professionals in the Caribbean Region, with pragmatic, practical solutions to integrate the assessment of climate risks and resilience opportunities in the preparation of infrastructure projects through PPPs.</p> <p><i>Keywords: Jamaica/Caribbean context, PPP, toolkit, infrastructure focus</i>⁶³ 14/01/2025 11:05:00</p>
 <p>The cover features a stylized graphic of a person's profile in shades of purple and pink, with various icons representing economic, social, and environmental priorities.</p>	<p>LGA (2021). <i>Sustainable procurement: Delivering local economic, social and environmental priorities - A toolkit for commissioners, procurement practitioners and contract managers</i></p> <p>A toolkit for mobilising commissioning, procurement and contract management to deliver relevant economic, social and environmental outcomes. The process they outline is relevant to our procurement for adaptation focus.</p> <p><i>Keywords: Procurement process, UK context, local government focus, toolkit</i>⁶⁴</p>
 <p>The cover features a graphic with green and blue diagonal stripes on a dark background. Text includes 'A ROADMAP TO RESILIENCE INCENTIVIZATION' and 'August 2020'.</p>	<p>Multi-Hazard Mitigation Council (MMC) Committee on Finance, Insurance, and Real Estate (CFIRE) (2020). <i>A Roadmap to Resilience Incentivization</i></p> <p>This document establishes a set of public and private incentives to owners of buildings and other infrastructure to facilitate the upgrade of existing infrastructure and better design of new infrastructure. Its authors propose to develop of a set of incentives by which finance, insurance, real estate, and government infrastructure stakeholders share more fairly the mitigation costs. Incentives can be built into mortgages, insurance policies, tax incentives, grants, and other mechanisms.</p> <p><i>Keywords: Buildings and infrastructure focus, incentivising adaptation, USA context</i> ⁶⁵</p>

	<p>Procure4Health Project</p> <p>EU project aiming to overcome barriers to EU-wide adoption of innovation procurement by creating an open community of health and care procurement stakeholders. It promotes innovation procurement through knowledge sharing and capacity building, networking and matchmaking, identification of common needs and the launch of joint actions to address them as well as influencing policy on procurement of innovation.</p> <p><i>Keywords: European focus, networking, innovation procurement</i>⁶⁶</p>
	<p>WHO (2023). Public-private partnerships for health care infrastructure and services: policy considerations for middle-income countries in Europe</p> <p>Middle-income countries in the WHO European Region face common challenges to the efficiency of their health systems, such as lack of capacity at the primary care level, obsolete infrastructure, high out-of-pocket payments, or even an excess of hospitals and specialized facilities. In many countries, there is a perception that public-private partnerships (PPPs) can play a role in addressing these challenges. These are long-term contracts between private and public entities to provide health facilities, equipment or services. With countries increasingly interested in PPPs to mobilize funds and promote reforms in their health systems, this new WHO/Europe report offers key actions governments can take to optimize PPPs in healthcare.</p> <p><i>Keywords: PPP, European middle-income focus, healthcare focus, private sector health financing, capital investments</i>⁶⁷</p>
	<p>Zerbe, J. – Action on Climate Team (ACT) at Simon Fraser University (2019). Paying for Urban Infrastructure Adaptation in Canada - An Analysis of Current and Emerging Economic Instruments for Local Governments</p> <p>This report provides descriptions and examples of new and emerging tools for paying for climate adaptation, as well as existing tools that have experienced recent uptake in Canadian communities. It highlights opportunities and examples of tools that have the potential to support the integration of adaptation and mitigation (SFU developed a term Low Carbon Resilience for this) efforts. It distinguishes between funding tools (which allow governments to make up-front payments or to recoup costs) and financing tools (which allow capital to be secured in advance). Some are current tools that are commonly used in Canada others are emerging tools that have the potential for greater uptake and use.</p> <p><i>Keywords: Canadian context, infrastructure, local government, adaptation, mitigation</i>¹⁶</p>

Appendix B: Questions to ask for assurance when making procurement decisions

Questions to ask when reviewing risk analysis information	
About the hazards	<ul style="list-style-type: none"> • What are the main physical climate change hazards at the facility? • How are the hazards different in different future scenarios? • How will the hazard interact with the physical infrastructure? • How will the physical future hazard interact with the needs and service delivery of future health demographics affected by non-physical aspects of climate change? (e.g. how a healthcare facility adapts physically to physical risks of a changing climate alongside the health risks of a changing climate?)
About exposure	<ul style="list-style-type: none"> • Which geographical locations of the facility are impacted by the hazard? • Which facility services are impacted by the hazard? • How are the impacts felt? • Do these controls take into account future scenarios? • Who is most impacted by the risks?
About exposure	<ul style="list-style-type: none"> • Are there any locations or groups of people who are more vulnerable to a given risk? • Might multiple risks arise at the same time (e.g. extreme cold, wind & flooding simultaneously)? • What are the second order impacts of the climate change risks?
About risk	<ul style="list-style-type: none"> • Is reducing vulnerability or exposure likely to be more effective? • Are there alternative arrangements already in place to control the risk?

Questions to ask about the policy and strategy landscape	
Policy and legal landscape	<ul style="list-style-type: none"> • What are the relevant policy and legal documents that apply to the facility in question Internationally /At national level / Within the healthcare sector / within the organisation/ At the facility? • What are current adaptation risks and concerns within those documents? • What are current adaptation focus and priority areas within those documents? • Does the organisation's procurement strategy and processes to align to these?
Funding streams	<ul style="list-style-type: none"> • Are any major funding or financing opportunities flagged? • What kinds of activities are promoted/encouraged or restricted in these programmes?
Stakeholders	<ul style="list-style-type: none"> • What are the key organisations and stakeholders working in this space? • What are their main concerns or focus areas? • Does the organisation's procurement strategy and processes to align to these?
Reporting requirements	<ul style="list-style-type: none"> • Are there any kinds of adaptation reporting requirements in place? • Does the organisation's procurement strategy and processes to align to these?

Questions to ask when thinking about costs	
<p>Does the cost-benefit analysis (CBA) include the following Costs and Disadvantages in analysis?</p>	<ul style="list-style-type: none"> • Up-front costs • Innovation and development costs • Procuring the goods or services • Consultancy advice during procurement and installation • Decommissioning of old system • Commissioning and certification costs • Waste removal • Meeting regulatory requirements and design codes. • Ongoing costs • Operational expenditure and consumables • Maintenance (staff time and spares) • Licensing and annual fees • Other non-financial costs • Delivery schedule and development time • Any organisational/sectoral/national priorities not addressed or negatively impacted by the intervention • Disruption to healthcare services during installation
<p>Does the CBA incorporate the following Benefits or Costs Avoided in analysis?</p>	<ul style="list-style-type: none"> • Hospital better suited to current environment/climate – avoided or reduced disruption to services limited during existing risk events. • Hospital compatible or better suited or has flexibility to suit future environment/climate – avoided or reduced disruption to services limited during existing risk events. • Improved staff satisfaction/retention – lower staff recruitment and training costs • More efficient use of finite resources on a day-to-day basis (staff and consumables) • More efficient and effective use of finite resources during a risk event • Asset uses fewer resources to maintain or reduced maintenance schedule or maintenance bill • Reduced waste and recycling bill • Asset still useable in future - supply chain still viable • Other organisational/sectoral/national priorities also positively impacted by the intervention as a secondary benefit • Clean-up costs avoided or reduced • Insurance premiums avoided or reduced

Questions to ask when reviewing and selecting funding options	
Procedural considerations	<ul style="list-style-type: none"> • What is the process for receiving funding through this route/funding mechanism? • What information is required to be presented to the funding body?
Timescale considerations	<ul style="list-style-type: none"> • What are the timescales associated with the funding? • How often are there funding calls (rolling call, regular calls, ad hoc)? • What is the time between submitting an application and receiving an answer? • After a decision how long will it take get access to funds?
Kinds of projects supported	<ul style="list-style-type: none"> • What kinds of project does the funding organisation support? • Are there any limitations or particular focus areas for the organisation or the fund? • Are there particular kinds of expenditure that are eligible or ineligible? • Are there limits, caveats, thresholds etc. which will determine which interventions are fundable? Some sources of funding <ul style="list-style-type: none"> ○ Are only available in certain countries ○ Are only available to certain types or sizes of organisations ○ Might require match funding ○ Might only be available for certain kinds of activities ○ Might exclude certain activities or kinds of expenditure – so would everything be covered if not, where would those costs come from?
Ethical considerations	<ul style="list-style-type: none"> • What are the ethical/social/environmental implications of choosing one source of funding route or organisation over another? • How does the funder and funding align with social value legislation/guidance in the country of operation/ the healthcare organisation¹?
Financial considerations	<ul style="list-style-type: none"> • What are the repayment terms? • Does the healthcare organisation ultimately have to pay any of the money back? • If so, how much does the healthcare organisation have to pay and is there interest? • What are the repayment timescales? • How much will the project cost over the loan lifetime? • Where is the money ultimately coming from? If the healthcare organisation is taking on debt, that addresses the immediate upfront costs, but not the long-term resources. • Would it be possible / necessary to use multiple funding mechanisms – for different parts of the intervention? Will this make a difference to delivery timescales?
Resourcing implications	<ul style="list-style-type: none"> • What would be the consequences/implications for the healthcare organisation? • Consider not only the cost (over the lifetime of the intervention), but also: • What timescales are included? How long is the healthcare organisation locked into if there are repayments? What are the terms and conditions like? • What is the establishment and maintenance effort to secure funding via this route? How much time would be needed to write a bid/application for funding? What kind of reporting on progress is required? Are there Key Performance Indicators involved? How will the healthcare organisation monitor and report back to the funder on progress? • Is the healthcare organisation ready to accept funding via that route?
Wider procedural considerations	<ul style="list-style-type: none"> • What would be the best funding mechanism balancing the pros/cons? • How is the healthcare organisation going to make a decision about which option to choose? • How is the healthcare organisation going to be transparent about the decisions it has taken? Who does the healthcare organisation need to share this information with and how will this happen?

¹ See for example, The Social Value Model in the UK, <https://www.gov.uk/government/publications/procurement-policy-note-0620-taking-account-of-social-value-in-the-award-of-central-government-contracts>

Questions to ask when selecting an intervention	
Addressing risk effectiveness:	<ul style="list-style-type: none"> • What kind(s) of risk/s does the adaptation address? • How effective is the adaptation intervention at addressing the risks identified? • How is effectiveness determined? • How does this intervention address the risk? • Does the intervention cause any other risks (maladaptation)? • Will the intervention move the risk to another area or to another group of people?
Addressing intention	<ul style="list-style-type: none"> • How does the intervention align or support organisational/sectoral/national priorities, actions and strategies for adaptation? • Will the adaptation option impact risks other than the intended climate risk to support other organisational objectives (e.g. sustainability, resource efficiency or social value creation)?
Addressing mitigation and social value	<ul style="list-style-type: none"> • Does the intervention produce more emissions? (Non-mitigation) • Does the intervention contribute positively to sustainability and social value?
Addressing robustness and flexibility:	<ul style="list-style-type: none"> • Will the option be robust under today's climate / Will the option be robust under a series of different and plausible climate change futures? • Does the intervention have inbuilt flexibility so it can be reconfigured, reused or modified to be used differently in the future?
Addressing feasibility	<ul style="list-style-type: none"> • Can the intervention realistically be implemented? • What are the temporary consequences on the hospital of the roll out/installation/construction? Is there a plan to manage these?
Addressing funding	<ul style="list-style-type: none"> • What information does the organisation have on existing internal funding? • What funding/financing can cover the upfront costs for the scale of the project? • Is there a clear plan for how the costs would ultimately be covered? • How will ongoing costs (maintenance and consumables etc.) be covered?
Addressing synergy and equity	<ul style="list-style-type: none"> • How will the intervention interact (positively or negatively) with other interventions? • Are there opportunities or synergies with other actions being planned that could promote further adaptation measures to be taken?
Addressing timing and urgency:	<ul style="list-style-type: none"> • How long will it take for the intervention to be implemented? • How long will it take to receive funding via selected funding/financing mechanism? • How do these timeframes link with the likelihood of risk within that timeframe? • What is the longevity of the intervention?
Addressing costs, costs saved, benefits and opportunities:	<ul style="list-style-type: none"> • Do the benefits of the interventions exceed the costs? • Have economic, social and environmental costs all been incorporated? • What are the whole life costs of the intervention, including: <ul style="list-style-type: none"> ○ Up-front costs for installation ○ Ongoing maintenance costs (personnel time and spares/equipment) ○ Ongoing costs (consumables, waste, and license fees) ○ Cost to decommission / end of life costs ○ Costs saved over the lifetime (reduced insurance premiums, reduced consumables usage, smaller maintenance schedule etc) • Has the organisation considered ongoing costs and resource efficiency objectives?
Addressing future procurement and supplier engagement	<ul style="list-style-type: none"> • Are there any relevant legal requirements for procurement of this kind of item? • Are there any relevant voluntary/industry standards or labels or criteria available? • How much time will it take to procure and implement? • Does the healthcare organisation have a/supplier(s) on board for this kind of intervention/item? • Does the solution involve innovation? Is the market ready? Could the healthcare organisation speak with potential suppliers to help them develop something innovative?

Questions to ask about the intervention specification	
Adaptation problem statement and strategy	<ul style="list-style-type: none"> • What problem is the intervention is trying to address? • Is it clear how the intervention will positively benefit adaptation? • Is the organisation’s adaptation strategy mentioned as a driver for change?
Project description	<ul style="list-style-type: none"> • What are the main parts of the project? • Is the project being broken down into different parts – if so, how will the different vendors be expected to work with each other? • What qualifications and experience are needed and when are climate resilience specialists required?
Performance criteria	<ul style="list-style-type: none"> • Are there any particular specifications for the project in terms of inclusions and exclusions? • What are the performance criteria for the intervention? • Are there any other regulatory requirements? • Are there any particular standards or certification requirements the intervention should meet (such as BREEAM, LEED etc. or EU Green Procurement criteria²)? • What technical specifications are there? (see also Appendix E: International Standards for some international standards which might apply to the intervention) • How will the intervention be reported on or monitored in the future? • How is effectiveness of the intervention being judged? • How are quality and reliability of the product determined? • Does the specification prompt an outcomes-based approach?
Timescales	<ul style="list-style-type: none"> • What are the timescales (key milestones and dates) associated with the project? • What is the lifetime expectation of the intervention (how long is it expected to last)? • How is climate change adaptation built into the intervention lifetime (considering the installation, consumables, maintenance, decommissioning etc)? • How long is the contract likely to be in place? • How are vendors encouraged to design long-term solutions?
Procurement Staff skills	<ul style="list-style-type: none"> • Are staff involved in procurement decisions aware of adaptation priorities? • Do staff involved in procurement decisions know how to incorporate priorities into design specifications?
Innovation	<ul style="list-style-type: none"> • What key elements of the project are fixed and understood, which aspects require creativity? • Beyond the intervention contributing to adaptation, are vendors encouraged to demonstrate adaptation to climate change themselves? • How to work with suppliers to develop new products / services to meet the adaptation need?
Other benefits	<ul style="list-style-type: none"> • How does the intervention support other social, economic and environmental priorities? • How does the intervention jointly support mitigation?
Vendors	<ul style="list-style-type: none"> • How are vendors expected to contribute to adaptation in this project? • Are there particular vendors that the healthcare organisation is looking to support (because they are innovative, support other organisational priorities)? • Are there adaptation reasons to exclude any vendors from competing?

² The EU produces voluntary Green Public Procurement criteria for a variety purchase types. Any organisation can choose to incorporate the common GPP criteria into procurement specification to drive consistent improvements from a ‘Green’ perspective. Such measures also improve contract management by signalling to suppliers a consistent benchmark standard for the goods and services they supply. Only a small number of the current list of purchase types are likely to be relevant for climate adaptation procurement in a hospital setting as the considerations do not necessarily account for how to procure in a way which supports adaptation specifically. Of the list of criteria currently available only *Office building design, construction and management, Public space maintenance, and Paints, varnishes and road markings* are likely to be of any use to a hospital procuring for an infrastructure adaptation project. https://green-business.ec.europa.eu/green-public-procurement/gpp-criteria-and-requirements_en

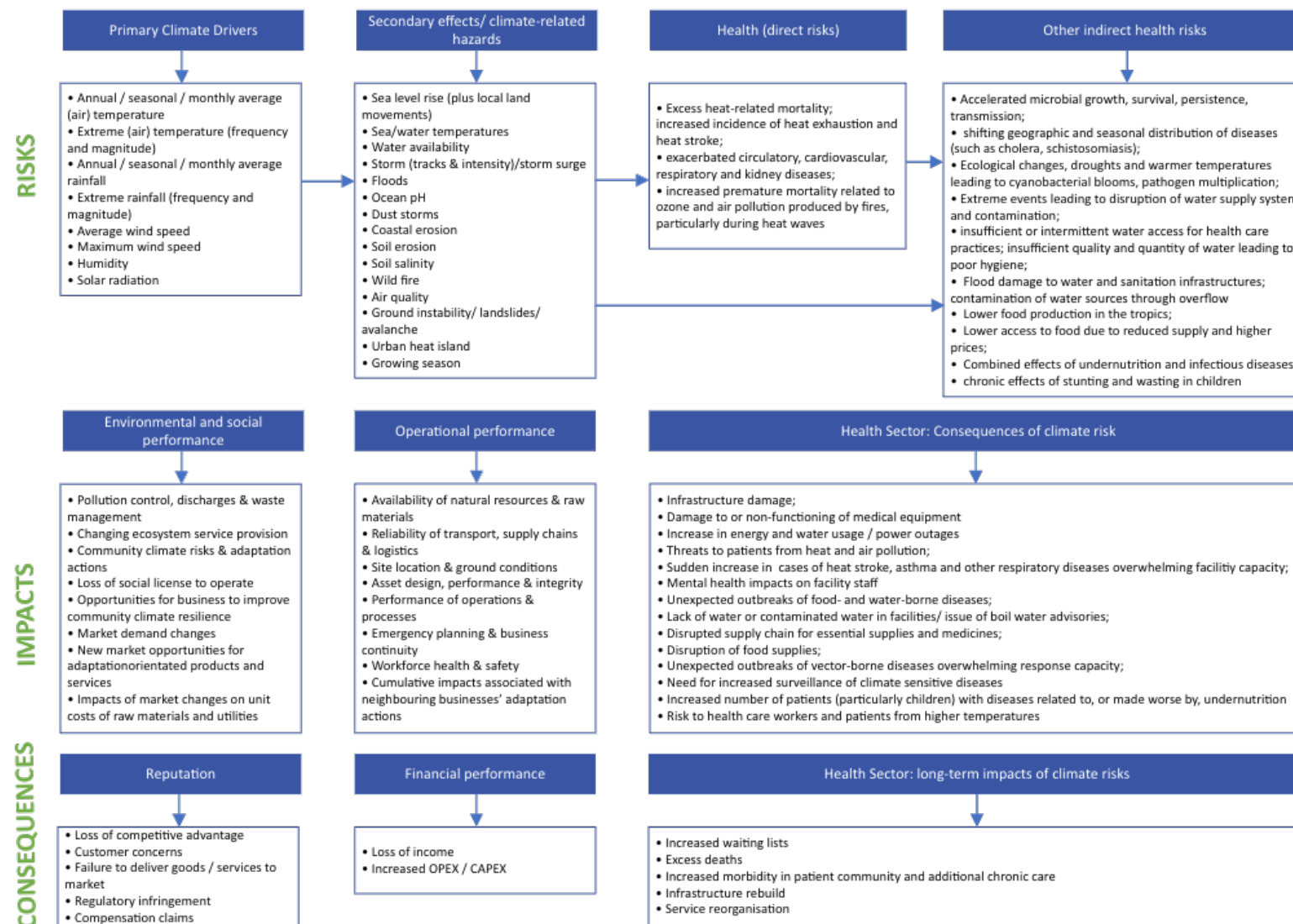
	<ul style="list-style-type: none"> • What qualifications or experience does the vendor need to include? Do these discourage innovation or smaller organisations from participating? • What are the healthcare organisation’s grounds for excluding a vendor from bidding? • Are the selection criteria for awarding a vendor clear? Do they mention adaptation?
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Questions to ask when selecting a supplier and intervention proposal	
About the proposal	<ul style="list-style-type: none"> • Does the proposal consider all reasonable options (is there a specific intervention the healthcare organisation is hoping to be presented with)? • Does the proposal address the adaptation challenge and identified risks? • Does the proposal address future climate scenarios? Would the proposed solution still work in future climate environment? • Do the maintenance and supply chain requirements for the proposal account for future scenarios? • Is the proposal viable in the healthcare, country and organisational context? • Are the timescales proposed reasonable? • How does the proposal incorporate flexibility and uncertainty over the lifetime of the project? • Does the proposal account for life-time costs (see Element 3) adequately?
About the supplier	<ul style="list-style-type: none"> • How does the supplier plan to manage innovation? • Has the supplier included climate specialists and climate information in their proposed approach? • Does the supplier have (or have access to) relevant and or necessary qualifications and experience for this kind of adaptation? • How is the supplier proposing to manage risks over the contract lifetime? • How has the supplier proposed to manage change needed over the course of the project? • How does the supplier propose to work well with other technical specialists and suppliers on the project? • Does the supplier have business continuity plans in place?

Questions to ask about contract, project and programme management	
Organisational structure and process	<ul style="list-style-type: none"> • How does the organisational structure for the project <ul style="list-style-type: none"> ○ support climate adaptation goals? ○ enable collaboration and engagement between parties? ○ encourage a long-term approach to achieving climate adaptation? ○ limit the potential for maladaptation? ○ manage risk within contracts, projects and wider programmes of activity? ○ adapt to change within the lifetime of the project? ○ build strong and productive relationships with suppliers?
Key performance indicators	<ul style="list-style-type: none"> • What are the key performance indicators for the project? • How do the KPIs support adaptation? • Are the KPIs appropriate indicators of climate adaptation?

Questions about monitoring and reporting on adaptation	
About the reporting and monitoring process	<ul style="list-style-type: none"> • Who is involved in monitoring activity? • Who needs to receive the outputs of monitoring and reporting activity (internal stakeholders, wider project stakeholders, national reporting body, academic partner)? <ul style="list-style-type: none"> ○ What is their interest in the information? ○ What format do they need the information in? ○ Is there a statutory obligation to report about certain aspects of the project? • How does the healthcare organisation’s internal reporting feed into national and sectoral perspectives on adaptation action that has been undertaken? • Is the healthcare organisation proactively collecting information which is used in reporting? • Is the healthcare organisation incorporating monitoring information into future procurement decision-making?
About the intervention	<ul style="list-style-type: none"> • The name and address of the hospital/facility where the intervention has taken place • Details about the intervention – what specifically was implemented? • What was the reason or the trigger for taking action? • What risk(s) was the intervention designed to address? • Were there any other benefits from implementing the adaptation measure? • How is the healthcare organisation measuring successful adaptation? What KPIs are in use? • How long did it take to complete the adaptation and when was the action completed? • How much did the adaptation cost? • Where did the funding come for to pay for up-front costs? • Where did funding ultimately come from? • Has the healthcare organisation captured data about the intervention and put it into the inventory? • What worked well and what challenges did the healthcare organisation face? • Has the healthcare organisation shared this with others? • Was there anything innovative about the project which could be developed further for the benefit of the health sector? • How did the healthcare organisation manage funding? When will the costs be paid off? • What barriers might there be to other healthcare organisations?

Appendix C: Healthcare Climate Risk and Consequences Flow Chart



Adapted from WHO Guidance for climate resilient and environmentally sustainable health care facilities (2020) and EC, Guidelines for Project Managers: Making vulnerable investments climate resilient (ND)

Appendix D: Policy Landscape Aspects to Consider

International Context	<ul style="list-style-type: none"> UN ‘Sustainable development goals’ (SDGs) - 17 linked global goals developed in 2015 to address climate change alongside ending poverty, improving health and education, reducing inequality, protecting the environment and driving economic growth. SDG 13 and SDG 11 are most relevant to climate change adaptation and resilience in healthcare. Two elements of the 2015 Paris Agreement on Climate Change specifically address adaptation. Article 7 made a global commitment to adaptation, specifically, ‘enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change’. Article 14 sets out the global stocktake review every 5 years (including the effectiveness of and support for adaptation). As a result of this, there is now more focus on measuring and accounting for adaptation amongst UN bodies and other international agencies – although the means by which adaptation is measured and reported on adaptation specifically are still emerging in a practical sense (Fisher, 2023). The Glasgow Climate Pact which emerged from COP26 climate negotiations in 2021, committed governments to doubling funding for adaptation to around \$40 billion a year by 2025. <p>Typical national documents in support of the international agreements are:</p> <ul style="list-style-type: none"> Nationally Determined Commitments (NDCs): Commitments made by Paris Agreement signatories about what that country intends to do to reduce national emissions and adapt to the impacts of climate change. Register of NDCs by country: https://unfccc.int/NDCREG Adaptation Communication: Each Paris Agreement signatory should regularly submit an adaptation communication, containing information on its priorities, implementation and support needs, plans and actions, focusing specifically on adaptation. Register of submitted ACs: https://unfccc.int/ACR National Adaptation Plan (NAP): Some Paris Agreement countries formulate and implement NAPs to identifying medium- and long-term adaptation needs, and developing and implementing strategies and programmes to address those needs. To find a country’s submitted NAP (if they have submitted one) – click on this link: https://napcentral.org/submitted-naps.
National and Regional Context	<ul style="list-style-type: none"> Climate change legislation - this may exist as a standalone statute or may be embedded within other legislation at national level. There may also (where relevant) be additional legislation at federal (or equivalent) level. A climate change risk assessment – this may also include a specific section on healthcare risk from climate change – both social / epidemiological, as well as physical risks to the health sector. Policies/strategies for financing climate change interventions (e.g. a Green Finance Strategy) Reports published by an independent panel on climate change (e.g. the UK’s Climate Change Committee or Germany’s Council of Experts on Climate Change). National budgets and specific programmes of financial support for climate change interventions (in particular, adaptation).
Health Sector	<ul style="list-style-type: none"> Health National Adaptation Plans (HNAPs) are developed by a country’s ministry for health as part of the main NAP. The HNAP outlines actions to build climate-resilient health, and systems that can anticipate, absorb and transform in a changing climate so that population health is protected. Health sector adaptation reports Health sector climate change risk assessments
Organisation and Facility Level	<ul style="list-style-type: none"> Local risk assessments – what the climate risks at an organisational or facility level are. Climate change and /or resilience policy – including strategic objectives, priorities and any climate goals or commitments. This establishes what the organisation or facility wants to achieve.

	<ul style="list-style-type: none"> • Climate change mitigation and adaptation plans – how the organisation or facility is taking steps to make change and the timescales for this. • Climate change reporting – if the organisation or facility has made any commitments to climate change, how and when do they track progress against these. • Budgets – where might there be room in organisation or facility budgets for climate change adaptation spending. • Green procurement policy - any document specifying procurement procedures, in particular how those align with sustainability and climate change goals • Other social value expectations – are there any other climate change mitigation, social welfare, sustainability or environmental goals.
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Appendix E: International Standards

Standard	Comment
ISO 4931-1: Buildings and Civil Engineering Works – Principles, framework, guidance for resilience design. Part 1: Adaptation to Climate Change.	<p>The document provides principles, framework, and guidance for resilience design adaptive to climate change (RDACC) in buildings and civil engineering works. RDACC is applicable to both new construction and retrofits. Seems to be in partly based on BS 8631:2021. It provides a set of principles for resilience design in building projects:</p> <ul style="list-style-type: none"> • Change-oriented perspectives – climate is going to change over the course of an asset’s service life • Don’t wait for certainty to take action • Synergies between adaptation and mitigation • Synergies between community and urban resilience – it’s a fundamental element of resilience • Adaptation should be equitable • Adaptation sits within a wider framework of sustainable development <p>Annex E also outlines typical adaptation strategies: Reduce exposure / Withstand / Absorb / Redundancy / Passive survival /Ease of replacement</p>
<p>There is an emerging family of international standards on climate change adaptation – under the umbrella of ISO 14090.</p> <p>ISO 14090:2019, Adaptation to Climate Change - Principles, Requirements and guidelines.</p>	<p>Positions Adaptation Pathway as an effective approach for planning for climate change uncertainty. It contains a full framework for implementing an adaptation plan and can be used in conjunction with BS 8631:2021.</p> <p>It covers the following information about the following aspects: Pre-planning / Assessing impacts including opportunities / Adaptation planning / Implementation / Monitoring and evaluation / Reporting and communication. It includes useful definitions on <i>Climate</i>, <i>Climate Change</i> and <i>Climate Change Mitigation</i>.</p>
BS ISO 14091:2021 Adaptation to Climate Change – Guidelines on vulnerability, impact and risk assessment	This document gives guidelines for assessing the risks related to the potential impacts of climate change. It describes how to develop and implement a sound risk assessment in the context of climate change and can be used for current and future risks.
BS ISO 14092:2020, Adaptation to Climate Change – Requirements and guidance on adaptation planning for local governments and communities	This is perhaps less relevant for the health sector – it provides advice and guidance for local governments and communities in relation to climate adaptation. It covers establishing priorities, developing and maintaining adaptation plans based on risk assessments and analysis of vulnerabilities and impacts from different climate change scenarios.
BS ISO 14093:2022 Mechanism for financing local adaptation to climate change – Performance – based climate resilience grants – requirements and guidelines	This document is based on the UN Capital Development Fund’s (UNDCF’s) finance mechanism (Local climate adaptive living – LoCAL) – which supports budgetary and capacity building challenges faced by subnational authorities, particularly in under developed countries. The document outlines a country-based mechanism for financing local adaptation.
BS 8631:2021 Adaptation to Climate Change - Using adaptation	Gives guidance on the following aspects of adaptation pathways (AP) using a 9-step adaptation pathway – which is useful but falls short of examining






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<p>pathways for decision making – guide.</p>	<p>how procurement financing will impact on the kinds of adaptations that are possible.</p> <ul style="list-style-type: none"> • Step 1: planning (scope, objectives, constraints) • Step 2: Understand the risks and opportunities from current climate • Step 3: Understand the risks and opportunities from a range of climate change scenarios, including the highest climate scenarios • Step 4: Consider adaptation options for different levels of risks and opportunities, and their thresholds • Step 5: Identify and evaluate the implications of interdependencies with other drivers • Step 6: Assemble a route map of adaptation pathways • Step 7: Evaluate and choose adaptation pathways • Step 8: Report preferred adaptation pathways • Step 9: Set out implementation, monitoring and evaluation plans <p>It includes definition of <i>climate change adaptation</i>.</p>
<p>There is a family of standards in development around water systems and services.</p> <p>BS ISO 24566:2023, Drinking water, wastewater and storm water systems and services – Adaptation of water services to climate change impacts.</p> <p>BS ISO 24566-1:2023 Part 1: Assessment Principles</p>	<p>This document establishes principles for integrating climate change impacts into planning and design activities of water utilities for water services and includes methods of assessing the principles in the context of climate change as well as examples of adaptations.</p> <p>The following documents are in development.</p> <ul style="list-style-type: none"> • BS ISO 24566-2:2023 Part 2: Stormwater services (this is in draft for consultation). • BS ISO 24566-3:2023 Part 3: Drinking water systems (forthcoming). • BS ISO 24566-4:2023 Part 4: Wastewater systems (forthcoming). <p>These are supported by existing standards around water:</p> <ul style="list-style-type: none"> • ISO 24536:2019 Service activities relating to drinking water supply, wastewater and stormwater systems – guidelines for stormwater management in urban areas • ISO 24539:2019 Service activities relating to drinking water supply, wastewater and stormwater systems – Examples of good practices for stormwater management
<p>ISO 15392:2019, Sustainability in buildings and civil engineering works – General principles.</p>	<p>This document identifies and establishes general principles for the contribution of buildings, civil engineering works and other types of construction works to sustainable development.</p>
<p>Global Building Resilience Guidelines:</p>	<p>These are intended to assist building and standards writing bodies to develop building codes and standards which incorporate ‘future-focused climate resilience’. It has a useful definition of <i>Building Resilience</i>. https://www.iccsafe.org/wp-content/uploads/22-21730_COMM_72922_Global_Resilience_Guidelines_FINAL_2.pdf</p>
<p>Green Public Procurement Criteria</p>	<p>https://green-business.ec.europa.eu/green-public-procurement/gpp-criteria-and-requirements_en</p>




Appendix F: Table of adaptation options

Adaptation interventions can be categorised in different ways depending on the way that they work to influence adaptive capacity. The following five broad categories, referred to as Key Type Measures (KTMs) were first developed in 2012 to aid reporting under the Water Framework Directive and were used in guidance recently published by the European Environment Agency (2023):







- governance and institutional: policy instruments, regulations and mechanisms to support and streamline adaptation;
- economic and finance: insurance, economic incentives and innovative financing mechanisms;
- knowledge and behavioural change: awareness raising, knowledge sharing and actions encouraging changes in consumption and lifestyle patterns;
- physical and technological: early warning systems (EWS), mapping, physical infrastructure and other sector-specific innovations;
- nature-based solutions (NBS) and ecosystem-based approaches: measures integrating nature, including green infrastructure, tree cover, water and soil regeneration.

Icon	Risk
	Extreme temperatures (hot and cold)
	Flooding (pluvial, fluvial, groundwater, surface water, coastal, storm surge, tsunami, overtopping of drainage capacity)
	Drought /water scarcity
	Wildfires/ air quality
	Extreme/high winds









The interventions listed in this appendix in the table below fall into the latter two categories as these deal directly with physical changes to hospital infrastructures to deal with the physical risks posed by climate change.

Kind of intervention	Main risk addressed	Other key considerations
Changes to heating, air conditioning, re-cycling and cooling/chilling systems <ul style="list-style-type: none"> • Increasing the capacity of existing systems • Improving efficiency of existing heating, air conditioning, re- cycling and cooling/chilling systems, or replacing out-dated systems • Provision of mobile/temporary heating, air conditioning and cooling systems – e.g. mobile ACs, portable fans • Better use of passive ventilation systems, e.g. cross ventilation / solar chimneys • Installation of ceiling fans • Manually and automatic controlling of windows • Systems for monitoring, managing and controlling temperature • Ventilating at particular times of the day • Improved draught proofing and sealing 		Likely to involve major intervention in a healthcare setting – may require moving or disrupting services for installation
Designing the building to limit the amount of thermal gain: <ul style="list-style-type: none"> • Include shutters, screens, reflective surfaces • Use of additional insulation and thermally efficient materials in walls/roof/floors 		External adaptations may involve less interruption to facility services than internal interventions.
Design and configuration of the building and assets, services, and flows or people through the spaces in relation to temperature: <ul style="list-style-type: none"> • Designing the building so that the layout of building considers where might be warmer or cooler and locates services and patients in the most effective location based on ideal temperature • Redesigning spaces according to temperature vulnerabilities • Considering the internal heat generated by / cooling needs of machinery and devices used for particular services 		This would involve major reorganisation of services and locations.

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<p>Reducing solar gain through windows/glazed areas:</p> <ul style="list-style-type: none"> • Reducing the total glazed area • Choosing the direction glazed areas face • Improved glazing or use of UV films – for reduced solar gain / improved insulation, and reduced UV • Use of screens/shades outside the building • Planting (trees, vegetation) to provide immediate shade/screening 		<p>Some of these interventions would involve major disruption to services in the area (e.g. the replacement of windows)</p>
<p>The use of green roofs for thermal regulation:</p> <ul style="list-style-type: none"> • In hot weather green roofs reduce solar heat gain, prevent the transfer of heat to the building below and provide a cooling effect through evapotranspiration, reducing ambient temperatures and alleviating the urban heat island effect • In cooler weather green roofs provide an additional layer of insulation, helping to retain heat within buildings 		<p>Existing roof structures may not be able to tolerate new loads. Other hospital machinery / plant may already be located on the roof.</p>
<p>Having physical systems in place to monitor for risk:</p> <ul style="list-style-type: none"> • Installing leak detection systems within the building (e.g. blocked drains, punctured waterproof membranes, overtopped bunds) • Installing flood warning systems on critical water courses • Monitoring systems will allow trends and patterns to be noted over time and can contribute to warning systems and alerts in the event that thresholds are reached 		
<p>Relocation / location / protection of critical services and routes out of at-risk areas:</p> <ul style="list-style-type: none"> • Critical assets and functions that are essential to the day-to-day function of the facility and incident management are not in flood risk areas (e.g. power generation, data centres, emergency departments and critical care, incident management and crisis command centres etc.) • Ensuring safe routes through the facility are available above ground (e.g. do not have to go into flood waters) and for all kinds of movements (including hospital beds, equipment and trolleys) • Reinforcing utilities services (electricity, medical gases, fuel, potable water) and considering how they are routed through the facility safely through or away from flood water 		
<p>Effective water management:</p> <p><u>Preventing stormwater management capacity issues in relation to rain falling onto the facility:</u> Diverting/Slowing water flow down / storing water and releasing it at a later time, so it takes longer to reach pinch points in stormwater and drainage/sewerage systems and downstream water courses (e.g. green roofs, trenches within carparks to attenuate excess rainwater, and underground storage tanks</p> <ul style="list-style-type: none"> • Increasing permeability of surfaces, so that water drains from multiple places, not just concentrated in a small number • Improvements to maintenance and maintenance design to ensure water flow is not impeded in roofs, gutters and drains <p><u>Rain falling onto adjacent land:</u> Landscape management - encompassing intentional planning, design, and implementation strategies aimed at managing and mitigating the impacts of floods within specific landscapes or watersheds – e.g new recharging ponds and river contour trenches, Sustainable Drainage Systems (SuDs) and bioswales, as well as the rehabilitation and preservation of existing ones.</p> <ul style="list-style-type: none"> • Acquiring adjacent land, often situated within respective flood plain areas, to mitigate flood risk (e.g. to manage it proactively to absorb greater volumes of water, or to prevent degradation of existing capacity) • Reducing water supply contamination from surface water and sewer flooding, through increased implementation of SuDS, catchment management and wetland creation 		
<p>Designing structural features which are beneficial during floods</p> <ul style="list-style-type: none"> • Functionality in flooding: e.g. motor vehicle ramps to dry first floor areas become boat launch – not just flows of people and resources inside the building, but also access/egress for supplies/ resources • Flexible and adaptable: Designing building layouts and spaces to be flexible and adaptable in flooding events, therefore allowing quick re-configuration of service locations, if flooding renders parts of the building inaccessible, or additional patients are received 		

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<ul style="list-style-type: none"> • Creating sacrificial areas/flood buffering zones: to channel any floodwater inside the building into (e.g. crawl spaces used for flood water under level 0) • Storage areas for essential supplies including fuels and medical gases 		
<p>Designing structural features which are beneficial after floods</p> <ul style="list-style-type: none"> • Easy cleaning: Choosing materials which are easy to clean after a flood event • Easy water removal: Mechanical plant and systems for pumping out flood water quickly • Installing dedicated heating plants 		
<p>Preventing water ingress (through walls, roofs and floors):</p> <ul style="list-style-type: none"> • Building flood walls • Insulating, sealing and waterproofing the building envelope • Temporary systems for flood protection and water ingress management – bolt on shutters/gates, flood barriers, using sandbags and expanding gel sausages at doors and entrances 		
<p>Water management systems – capture of rain water and efficient use of piped water</p> <ul style="list-style-type: none"> • Rainwater harvesting and re-use • Greywater collection and recycling • Use of appropriate water storage systems • Leak detection systems • Efficient taps and water discharge systems 		
<p>Drought resistant planting</p> <ul style="list-style-type: none"> • Using species that are drought tolerant and require minimal active watering • Planting to reduce evaporation and further water loss • Installation of green roofs 		
<p>Air filtration systems – temporary and fixed</p>		
<ul style="list-style-type: none"> • HVAC recirculation • Improvements to ventilation and ventilation standards • Adding green spaces to improve local air quality 		
<p>Improvements to /reinforcement of the building fabric</p> <ul style="list-style-type: none"> • Impact-resistant and safety windows – to withstand damage from high winds and flying debris • Reinforced roofs, aiming to mitigate risks arising from extreme wind speeds where the roof may be lifted up or damaged by flying debris • The use of glass fibre reinforced concrete to encapsulate structures and create a protective cocoon-like structure capable of withstanding extreme winds, e.g. external walls and critical parts of the building to provide shelter such as stairwells 		
<p>Designing the layout to account for critical services, vulnerabilities and protected areas:</p> <ul style="list-style-type: none"> • Relocation/locating critical services and functions away from external/vulnerable windows/ parts of the building • Relocation of electrical systems, utility plants and emergency generators are in separate, standalone, and resistant buildings • Multiple and or independent electrical and water supplies • Storage areas for fuels and medical gases 		<p>If there is space for family of staff members to shelter in the building this may improve likelihood of staff attending in a response.</p>