

MINUTES OF THE PLANNING, MAJOR DEVELOPMENTS, TRANSPORTATION AND ENVIRONMENT COMMITTEE HELD AT THE COUNCIL OFFICES, THE GROVE, SWANSCOMBE ON WEDNESDAY 28 SEPTEMBER 2022 AT 7.00PM

PRESENT: Councillor Peter Harris – Vice-Chairman in the Chair
Councillor Lorna Cross
Councillor Ann Duke
Councillor Maurice Weet

ALSO PRESENT: Graham Blew – Town Clerk

ABSENT: There were none.

The Chairman called on the meeting to observe a minutes silence in respect, and memory, of Her Majesty Queen Elizabeth II.

151/22-23. ARRANGEMENTS AND CONSTRAINTS REGARDING FILMING OR RECORDING THE MEETING.

The Chairman explained the arrangements and constraints relating to the filming or recording of the meeting.

152/22-23. APOLOGIES FOR ABSENCE.

An apology for absence was received from Councillor Linda Hall, due to other commitments.

An apology for absence was received from Councillor Peter Harman, due to other commitments.

An apology for absence was received from Councillor John Hayes, due to other commitments.

An apology for absence was received from Councillor Lesley Howes, due to other commitments.

Recommended: That the reasons for absence, for the Councillors listed, be formally accepted, and approved.

153/22-23. SUBSTITUTES.

There were none.

154/22-23. DECLARATIONS OF INTEREST IN ITEMS ON THE AGENDA.

There were none.

As per Standing Order 34 c) the Chairman adjourned the meeting at this point to allow members of the public to address the meeting in relation to the business being transacted at the meeting.

155/22-23. ITEMS DEEMED URGENT BY THE CHAIRMAN / MATTERS ARISING FROM PREVIOUS MINUTES AND THEIR POSITION ON THE AGENDA.

There were none.

156/22-23. TO CONFIRM AND SIGN THE MINUTES OF THE MEETING HELD ON 7 SEPTEMBER 2022.

Recommended: The Minutes of the meeting held on 7 September 2022 were confirmed and signed.

157/22-23. DARTFORD BOROUGH COUNCIL (DBC) – AIR QUALITY ACTION PLAN.

DBC were carrying out a consultation on a new Air Quality Action Plan which outlined what actions they would take, with their partners, to improve air quality in the borough between 2022 and 2027.

Members were provided with the information on 25 August 2022 with the consultation closing on 30 September 2022.

The Chairman advised that members were able to respond individually.

Recommended: That the item be noted.

TOWN PLANNING:

158/22-23. The following planning applications have been received from Dartford Borough Council / Ebbsfleet Development Corporation for Members observations (full details of these applications can be viewed via the Town Council, DBC and the EDC websites).

DA/22/01080/FUL	Erection of a single storey side and rear extension with garage conversion. 8 Eagles Road, Greenhithe.
OBSERVATIONS:	The Town Council are concerned that the proposal could result in increased parking requirements which would give rise to an increase in on street parking in an area where there is very limited capacity. Please ensure all neighbouring properties are consulted prior to the decision of this application.
DA/22/01093/TPO	Application for 3 No. Horse Chestnut Trees (in the car park next to 21 St. Peters Close) reduce all by 50% in height and 70% in spread (current height 20 metres spread 14 metres-estimated dimensions after works 11 metres height and 5 metres spread same as photos Council Trees 1 and 2) subject to Tree Preservation Order No.3 1991 Car Park adjacent 21 St Peters Close, Swanscombe

OBSERVATIONS:	<p>The Town Council object to this application as the proposed reduction is too severe and would detract from the visual amenity of the area.</p> <p>The trees are healthy and are not causing any risk therefore only the removal of any major dead wood and ivy growth from around the main stems/trunks should be undertaken.</p>
DA/22/01092/TPO	<p>Application for 3 No. Horse Chestnut Trees (in the car park next to 21 St. Peters Close) reduce all by 33% (current height 20 metres spread 14 metres-estimated dimensions after works 13 metres height and 9 metres spread), thin crowns by 30/40%, removal of dead or dangerous (see clarification of works) branches, crown lift to give ground clearance of around 5 metres subject to Tree Preservation Order No.3 1991</p> <p>Car Park adjacent 21 St Peters Close, Swanscombe.</p>
OBSERVATIONS:	<p>The Town Council object to this application as the proposed reduction is too severe and would detract from the visual amenity of the area.</p> <p>The trees are healthy and are not causing any risk therefore only the removal of any major dead wood and ivy growth from around the main stems/trunks should be undertaken.</p>

159/22-23. The following Granted Decision Notices have been submitted by Dartford Borough Council / Ebbsfleet Development Corporation for Members information.

DA/22/00751/ FUL	<p>Erection of a single storey front extension and work to the rear of removing the existing support post and replacing with new support posts</p> <p>32 Spring Vale, Greenhithe</p>
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160/22-23. **The following Refused Decision Notices have been submitted by Dartford Borough Council / Ebbsfleet Development Corporation for Members information.**

DA/22/00836/TPO	Application to fell 3 No. Horse Chestnut trees in the car park adjacent 21 St. Peters Close subject to Tree Preservation Order No.3 1991. 21/ 23 and 24 St. Peters Close, Swanscombe.
DA/22/00906/TDA	Application of determination pursuant to Schedule 2 Part 16 of the Town and Country Planning (General Permitted Development) (England) Order 2015 as to whether prior approval is required for the proposed 5G telecoms installation: H3G 15m street pole with additional equipment cabinets. Outside British Legion, London Road, Greenhithe.

There being no further business to transact, the Meeting closed at 7.15 pm.

Signed: _____
(Chairman)

Date: _____

Thames Estuary 2100: Shaping the future of the Thames Estuary

Public consultation open 26 September – 20 November 2022

Overview

The Thames Estuary is an international hub of cultural, commercial and economic activity. It contains some of the country's most valuable assets, critical infrastructure and transport networks within its reaches, as well as internationally protected habitats.

The vast and complex network of 330km of tidal flood defences, barriers and other structures continues to protect 1.42 million people and over £321 billion worth of homes from flooding from the sea. As climate change accelerates, sea level rises and the frequency of storm surges increases, these defences are having to work harder to reduce the risk of flooding to us, our homes, and vitally important habitat and wildlife in the estuary.

Sea level in the Thames Estuary has risen over the last century, and the rate of sea level rise is accelerating. Taking measures to alleviate this is no longer enough on its own; we must adapt to ensure the estuary remains resilient, today and into the future. No single organisation can manage this risk alone. In 2012, the Environment Agency and our partners published the [Thames Estuary 2100 Plan](#). The Plan is a long-term adaptive strategy for how flood risk management authorities (e.g., the Environment Agency, local councils and utility companies) can manage the increasing risk of tidal flooding due to climate change.

The Plan is adaptive as we regularly review and update it using the latest scientific evidence and data, allowing the best decisions to be made at the right time. We are carrying out the first full review and update of the Plan since it was published; the 10-Year Review. We plan to publish an updated Thames Estuary 2100 Plan in 2023.

We are now consulting with the public, our partners, businesses and service providers across the estuary on proposed content for the updated Thames Estuary 2100 Plan. This includes a new structure, proposed background content and most importantly, what we collectively want the updated Plan to achieve for you, the environment, and your riverside.

We are calling on communities, organisations and our partners to play their part in updating the Thames Estuary 2100 Plan by giving us your views.

Strategic Environmental Assessment

We have reviewed whether an update is required to the original Thames Estuary 2100 Plan's Strategic Environmental Assessment, which is a report proposing how the strategy's aims ensure more sustainable decisions and outcomes. A screening determination report has been prepared, which determines that proposed changes to the updated Plan are not anticipated to result in new or additional significant effects on the environment. We will be consulting with the statutory bodies for England on this screening determination during the public consultation period.



Why your views matter

With a rapidly changing climate, the need to plan together to improve the overall resilience of our local places is more important than ever before. The more we can plan together to deliver in partnership, the more we can deliver for local people, places and our environment.

Since the Thames Estuary 2100 Plan was published over 10 years ago, we have come a long way in improving our understanding of the evidence and data we review to gauge how and why the estuary is changing. We have also set new targets like reaching carbon net zero by 2030, have reviewed how to bring sustainability to the forefront of Plan, improved our understanding of the costs and benefits of the options in the Plan, and much more.

We recently worked with our partners to develop updated 'outcomes' based on this updated evidence. The outcomes set out what needs to be achieved in the estuary and by who, in order to manage flood risk and improve the riversides for people and wildlife. This is your opportunity to review these outcomes for the updated Plan, and tell us whether you support them, or whether you think they need to be amended. Some outcomes are for the whole estuary, whereas others are specific to certain areas. We want to know what you think the Plan needs to achieve, and how far it should aim to go to improve the estuary's resilience to climate change impacts.

We encourage you to submit your response to the questionnaire online, which will enable us to manage your comments more effectively. It will also help us to gather and summarise responses quickly, accurately and cost effectively.

If you respond online and provide an email address, your response will be automatically acknowledged, and you will receive a receipt.

You can also fill out the consultation at the drop-in events we are holding across the estuary. If you require a paper copy, please contact us at thamesestuary2100@environment-agency.gov.uk.

The consultation will close at 11:59pm on 20 November 2022.



About you, your understanding of the risk and awareness of Thames Estuary 2100

To help us analyse your responses we would like to understand whether you are responding as an individual providing your personal views, or on behalf of your organisation. Understanding who you are and your relationship to the Thames Estuary helps to give context to your answers.

We want to hear your views on climate change impacts and tidal flood risk in the Thames Estuary. This helps us to understand current perceptions and how these may have changed since the Plan was published. We also want to understand what you are currently doing to reduce the impacts of flooding and whether we need to do more to improve resilience to flooding in the estuary.

1. In what capacity are you responding to this consultation? (required)

Please select only one item:

- a. I am responding as an individual (these are my personal views)
- b. I am responding as an organisation (these are my organisation's views)
- c. Other

If you selected 'other', please explain your answer here.

Please note, we will only use your name and email address to collate responses and your details will not be published. We will only contact you to follow up on any offers of support, requests for involvement or to share the consultation summary.

Please provide your name:

Please provide your email address:

2. If you are responding on behalf of an organisation, please provide the name of your organisation and your role.

Organisation:

Please tell us your role. Please add any other comments you have:



How we will use your information

The Environment Agency will look to make all responses publicly available during and after the consultation, unless you have specifically requested that we keep your response confidential. We will not publish names of individuals who respond, or any data which could identify them.

We will also publish a summary of responses on our website in which we will publish the name of the organisation for those responses made on behalf of organisations.

In accordance with the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, we may be required to publish your response to this consultation, but will not include any personal information. If you have requested your response to be kept confidential, we may still be required to provide a summary of it.

For more information, see our [Personal Information Charter](#).

3. Can we publish your response? We will not publish any personal information, or any parts of your response which could reveal your identity. (required)

Please select only one item:

Yes

No

4. How does rising sea level within the Thames Estuary impact you? (required)

Sea level in the Thames Estuary is rising, and the rate of sea level rise has accelerated over the past few decades. This is in line with global rates of sea level rise. We update the Thames Estuary 2100 Plan to use the latest sea level rise data and UK climate projections (UKCP18) to determine the most appropriate options for managing flood risk, and the deadlines by when they need to be put into place.

Please select all that apply:

- I own a home/business/land in the Thames Estuary floodplain
- I use the river for recreation or commerce
- I use the river to commute to work
- I live within the flood zone
- I work within the flood zone
- Other

5. Do you feel equipped to prepare for impacts of sea level rise in the estuary?

Please select only one item

- Yes
- No
- Unsure



If you are unsure or do not feel equipped to prepare for these impacts, what support do you need?

Impacts of flooding as a result of rising sea level could be:

- Injury and loss of life
- Impacts to mental health and wellbeing
- Destruction of property and critical infrastructure
- Expensive buildings insurance in areas at high risk of flooding
- Pollution e.g., public health issues, killing fish
- Destruction of natural ecosystems, e.g., habitats and breeding grounds
- Impacts to local businesses

6. How do you benefit from the Thames Estuary 2100 Plan?

7. How important do you think it is to mitigate, and adapt to sea level rise?

Mitigating climate change impacts means taking actions to reduce the severity of them. Adapting to climate change impacts means adapting to life in a changing climate, which could be adjusting to actual climate change or an expected future climate. The Thames Estuary 2100 Plan uses a climate adaptation pathways approach to managing flood risk. This means that the deadlines for putting a flood risk management option in place can move forwards or backwards in time, depending on the rate of climate change we experience. This ensures that we don't put inappropriate options in place at the wrong time and then need to spend further investment and time changing them in the future.

	Not important	Somewhat important	Neutral
How important is it to mitigate to sea level rise?			
How important is it to adapt to sea level rise?			

Please explain your answer or add any comments here.



About the Thames Estuary 2100 Plan

Why do we need a long-term plan to manage flood risk in the estuary?

The areas of low-lying land (floodplains) of the Thames Estuary are home to over 1.42 million people and £321 billion worth of homes, as well as numerous sites of scientifically important habitat for wildlife. We also enjoy the river for leisure and use it to transport people and goods.

Flooding can occur in the Thames Estuary when high tides coincide with low-pressure weather systems, resulting in storm surges. Storm surges lead to additional water entering the estuary from the North Sea. The estuary's floodplains, and the homes within them, would be at significant risk of flooding if flood defences did not protect them.

A major flood could impact millions of people through the closure of major transport hubs and critical infrastructure, such as hospitals and schools. Businesses could also suffer from lost time and customers and put the region's reputation at risk as a major business and tourist hub.

We benefit from a world-class system of flood defences which work together to reduce the risk of flooding from the sea to London, Essex and Kent. This system includes:

- the Thames Barrier and 8 other major flood barriers
- over 330km of walls and embankments
- over 400 other structures such as flood gates, outfalls and pumps

The climate is changing causing sea levels to rise. As sea levels continue to rise, these structures are having to work harder, and a growing population means more people are living in the floodplain. These factors, combined with ageing flood defences means the risk of tidal flooding will increase over time, unless we all work together to manage this risk carefully. No single organisation can manage the increased risk of tidal flooding alone.

The Thames Estuary 2100 Plan sets out how we, together with our partners, can manage tidal flood risk in the estuary, sustain the estuary's economic and navigational importance, and improve the riverside for people and wildlife. It is internationally recognised as a leading example of a climate adaptation strategy, which enables risk management authorities and policy makers to plan, monitor and review how to adapt the riverside to manage tidal flood risk over time.

To adapt to climate change, flood walls, flood embankments and other fixed defences throughout the estuary will need to be raised by a metre or more by the end of the century. The Plan sets out a series of deadlines for raising defences over the next century according to the latest sea level rise projections. If this work is done in the absence of a plan for the riverside, we risk creating unwelcoming, poorly designed public spaces with reduced access to the river. There are significant social, environmental and economic benefits of reshaping our riversides at the same time as carrying out upgrades to flood defences. For this reason, the Plan also includes an approach that recommends that councils, communities and others work together to develop a vision for their future riverside. We call this the riverside strategy approach. We have recently supported the City of London to develop [the first riverside strategy](#) in the estuary.

The riverside strategy approach has the following key aspirations:

- Flood defences are raised to the recommended heights as set out in the Thames Estuary 2100 Plan



- Development is set back from the river to provide space for maintenance, future defence raising, access to the river and new habitat
- Land that will be required for future defence improvements is identified, and a plan developed to ensure it is available when required
- Existing or planned development behind the flood defences is not negatively impacted by the flood defences, now or in the future
- Delivering nature recovery through biodiversity net gain
- Local communities and river users have quality and uninterrupted access to the riverside, and the Thames Path can run continuously throughout the estuary
- The Thames riverside provides increased natural capital and supports local authority growth ambitions
- Communities remain connected to the river and are not cut off by higher flood walls, meaning they can continue to have access to it and views of the estuary
- Reduce the cost of defence raising, as they are realised through existing opportunities

We recognise that local councils can implement the riverside strategy approach in different ways across the estuary, based on the challenges and opportunities that are unique to each stretch of riverside.

An adaptive strategy for a changing climate

The Thames Estuary 2100 Plan uses an 'adaptation pathways approach' to manage flood risk. This means it sets out a series of possible 'pathways' for managing tidal flood risk in the estuary. It includes a decision-making framework for switching between pathways and uses the latest climate projections as a basis for those decisions. It is internationally recognised as the first strategy in the UK to set out how to manage tidal flood risk for a range of possible climate futures.

We regularly review and update the Plan to ensure it continues to set out the most effective way to manage tidal flood risk. This process allows us to assess what has changed in the estuary, and we expect to see changes in between these reviews. Based on these changes, we can then either switch the pathway, move a deadline for putting a flood risk management option into place, or update the core outcomes in the Plan, which set out what we and our partners need to do to manage flood risk. For example, if sea level rise projections show sea level is rising faster than previously thought, we can adapt the deadlines for raising flood defences to be earlier. Using this approach means that we can avoid continuously changing or adding to the options we put in place and ensures that we put the most cost-effective solutions into place at the right time.

Every 10 years, we carry out a full review and update of the Thames Estuary 2100 Plan. We are currently carrying out the first full review and update of the Plan since it was published in 2012: the 10-Year Review.



We expect the Thames Barrier to continue to protect London until 2070. The Plan then identifies several options to protect the Thames Estuary to the end of this century and beyond, which we expect to be in place by 2070:

- Upgrading the existing Thames Barrier and wider defence system
- Constructing a new Thames Barrier and upgrading the wider defence system
- Introducing multiple flood storage areas alongside the existing Thames Barrier, and upgrading the wider defence system

These are known as the Plan's end of century options, and we will need to decide which option to put in place by 2040 to ensure that it can be operational by 2070. As the Thames Estuary 2100 Plan is adaptive to a range of climate scenarios, it is possible that we may need to ensure this option is operational earlier than 2070. All end of century options need to remain 'live' so we can decide on the most appropriate option by 2040.

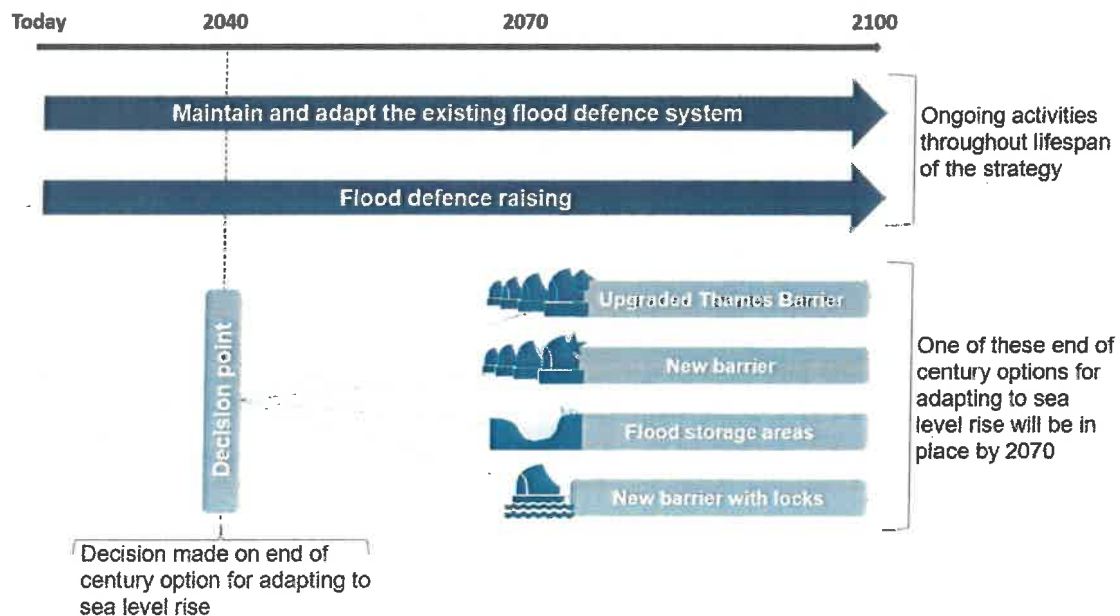


Image: A diagram showing the decision point for an end of century option in the Thames Estuary 2100 Plan

It is important to note that these options, or the dates when they are required will not change as part of this consultation. We will work with our partners to decide on an end of century option by 2040.

Phases and options in the Thames Estuary 2100 Plan

The Thames Estuary 2100 Plan can be split into three phases to describe the actions we need to take from now until the end of this century. Across all phases the Plan advises we maintain, adapt and raise flood defences in response to sea level rise (see the diagram below).



Phase 1 is split further into two time periods to reflect delivery of the Plan to date, whilst looking forward to 2035. From 2010 – 2022, we have refined the approach of how the existing flood defence network should be managed, alongside monitoring changes and planning for the future. The second part of phase 1, from 2023 – 2035, advises that we define visions for the future of our riversides, and begin to prepare and adapt our existing flood defences for sea level rise. This also includes securing land required for future improvements and enabling nature recovery.

Phase 2 is from 2035 – 2050, when we plan to reshape the riverside for future generations, raising flood defences as required. As part of updating the Plan, we are embedding sustainability and capturing the carbon net zero ambitions of those across the estuary responsible for delivering its outcomes.

Phase 3 is from 2050 to the end of the century. It is during this time period that we will need to put an option in place to adapt to rising sea levels for the end of the century and beyond. This could be building a new Thames Barrier in a different place, adapting the existing Thames Barrier, or a different option (see below to find out more about the options in the Plan).

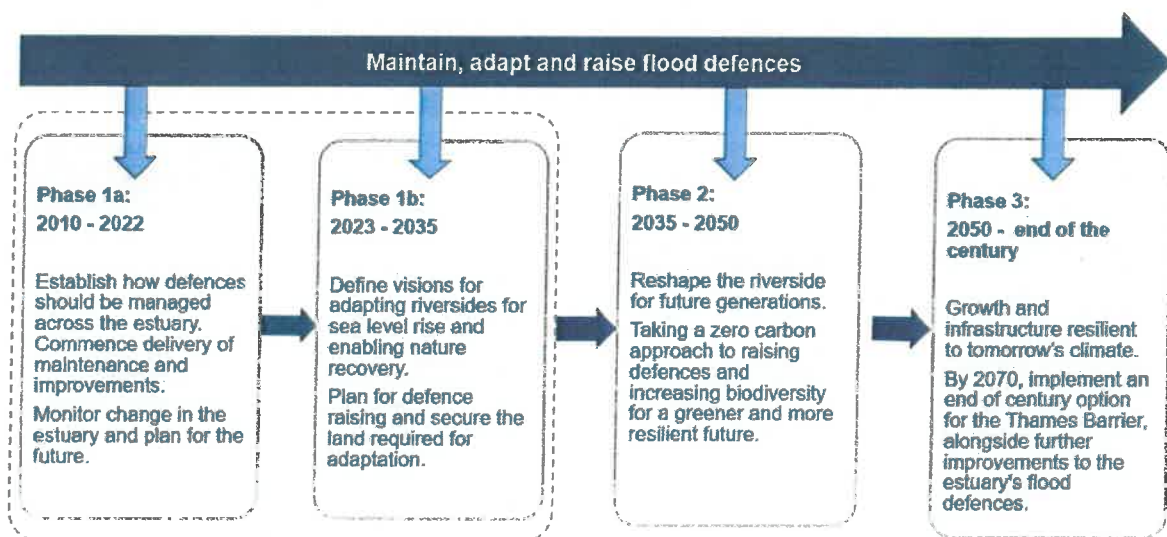


Image: A diagram showing the phases of the Thames Estuary 2100 Plan

The 10-Year Review

We monitor changes in the Thames Estuary every 5 years. This enables us to assess whether the estuary is changing in line with sea level rise projections, or slower or faster than expected. We also measure changes in the amount of people and property in the estuary, river flows, habitat and the condition of flood defences in the estuary, amongst other indicators of change.

Every 10 years, we carry out a full review and update of the Thames Estuary 2100 Plan. We are currently carrying out the 10-Year Review, the first full update since the Plan was published in 2012.

The 10-Year Review has three main phases (shown in the diagram below):



- Phase 1: The Monitoring Review – reviewing how the estuary has changed
- Phase 2: The Economic Review – assessing the costs and benefits of delivering the Plan
- Phase 3: Updating the Thames Estuary 2100 Plan – republishing the Plan with updated information and a new online format

We have also completed a significant number of technical studies and identified lessons learnt from the first 10 years of delivering the Plan.

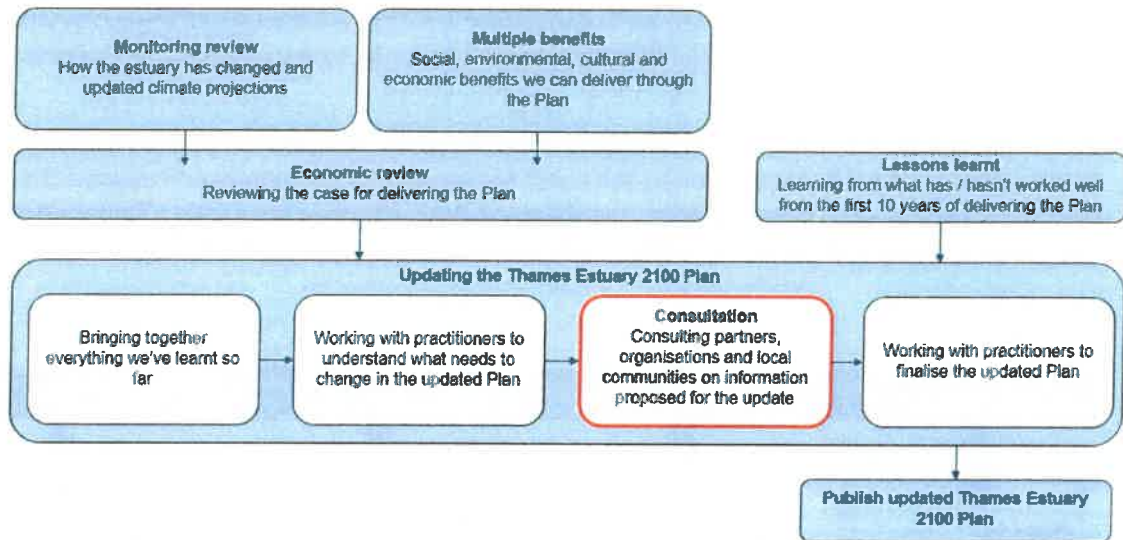


Image: A diagram showing components of the 10-Year Review

In 2021, we published the [key findings](#) from our Monitoring Review. We monitor physical changes in the estuary, such as sea level rise, and numbers of people and property, as well as changes to wider government policy and updated scientific guidance.

The Monitoring Review confirmed that:

- Sea level in the estuary has risen over the last century
- Sea level rise in the estuary has accelerated over the last few decades
- New UK climate change projections were published in 2018 (UKCP18)
- Almost all tidal flood defences in the estuary are classified as meeting or exceeding their target condition
- We expect we will need to close the Thames Barrier more frequently as sea level rise accelerates
- The number of people and property in the Plan area has increased to 1.42 million people and 586,000 residential properties

The Economic Review indicated that:

- The current pathway the Plan is following remains a robust option until 2049 (option 1.4 - maintaining and optimising existing flood defences)
- All end of century options (expected to be in place by 2070) need to remain 'live' in line with the Plan following an adaptation pathways approach



- The Thames Estuary 2100 Plan is still the most economically viable way to manage flood risk in the estuary

Alongside the Monitoring Review and Economic Review, we have also worked with our partners across the estuary to identify multiple benefits that the Plan can deliver beyond managing flood risk. These include social, cultural, economic and environmental benefits from delivering the objectives of the Plan (see diagram below). We know how to improve the ways that we work with our partners to deliver the Plan from reviewing what has and hasn't worked well over the first 10 years.

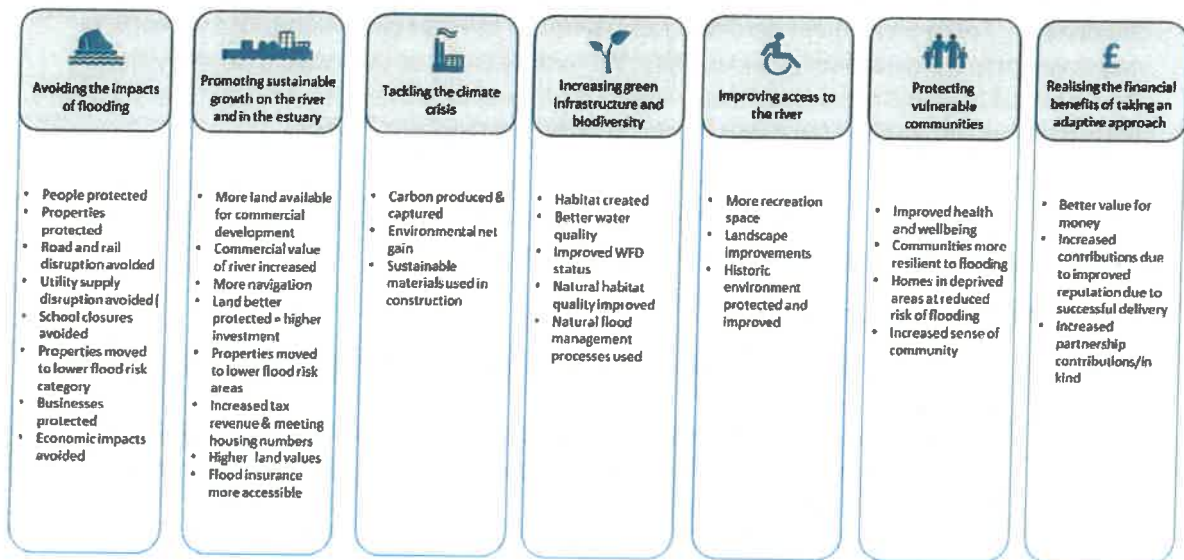


Image: A diagram showing the benefits of implementing the Thames Estuary 2100 Plan

In May and June 2022, we held several workshops with our partners to redraft what the Thames Estuary 2100 Plan should aim to achieve for the people and wildlife in the estuary. Since then, we have refined this further into a set of 'outcomes' which set out the Plan's remit across different themes, such as flood risk management, benefits and investment, and sustainability and habitat. This consultation asks whether you agree with these outcomes, or whether you think we need to amend them further.

We will review your responses to this consultation and use all the information from the 10-Year Review to update the Thames Estuary 2100 Plan so it is fit for the future.

What's at risk of flooding if we didn't have flood defences?

- 1.42 million people
- 586,000 residential properties worth £3.2 billion
- Over 55,000 commercial or industrial properties
- Central and local government, including the Houses of Parliament and City Hall
- Over 3100 hectares of heritage sites which provide around £15 billion of annual revenue from tourism
- Protected sites of high ecological importance
- Critical infrastructure, including 2400km of roads, almost 4000 electricity substations and 2 airports



- Over 700 healthcare centres and 68 emergency service stations
- 140 train or tube stations (one day of flooding in 2002 incurred a cost in delays alone of £0.74 million)
- Huge economic losses to the UK economy through impacts upon London's financial and business centres

A new structure for the Thames Estuary 2100 Plan

To improve how we monitor delivery of the Plan, we have created a new structure that is driven by benefits. These include the core flood risk benefits, but also span much wider to capture improvements to the economy and wildlife. We worked with our partners to identify these benefits and have built them into a new structure to provide a clear line of sight from the Plan's aims to the actions needed to deliver these benefits (see diagrams below).

The aims of the Thames Estuary 2100 Plan describe what the Plan intends to achieve for the estuary. The original Plan has 5 aims. We have refined these to 3 overarching aims which introduces a greater focus on sustainability as a fundamental part of the Plan.

The updated Plan will have three aims:

- Taking an adaptive approach to manage the risk of tidal flooding to people, property and the environment
- Protecting and enhancing the social, cultural and commercial value of the tidal Thames, its tidal tributaries and its floodplain, delivering benefits for communities and supporting resilient growth
- Tackling the climate and nature crises by putting sustainability at the heart of the Plan: enhancing and restoring ecosystems, reducing carbon, delivering environmental and biodiversity net gain, and enabling resilient communities

Each of the 3 aims links to one or more 'strategic objectives' which set out at a high level what the Environment Agency, our partners and other risk management authorities need to do to manage flood risk. These replace the 11 overarching 'recommendations' in the original Plan. Each set of strategic objectives can be linked to the multiple benefits that the Environment Agency and our partners could achieve from delivering them.

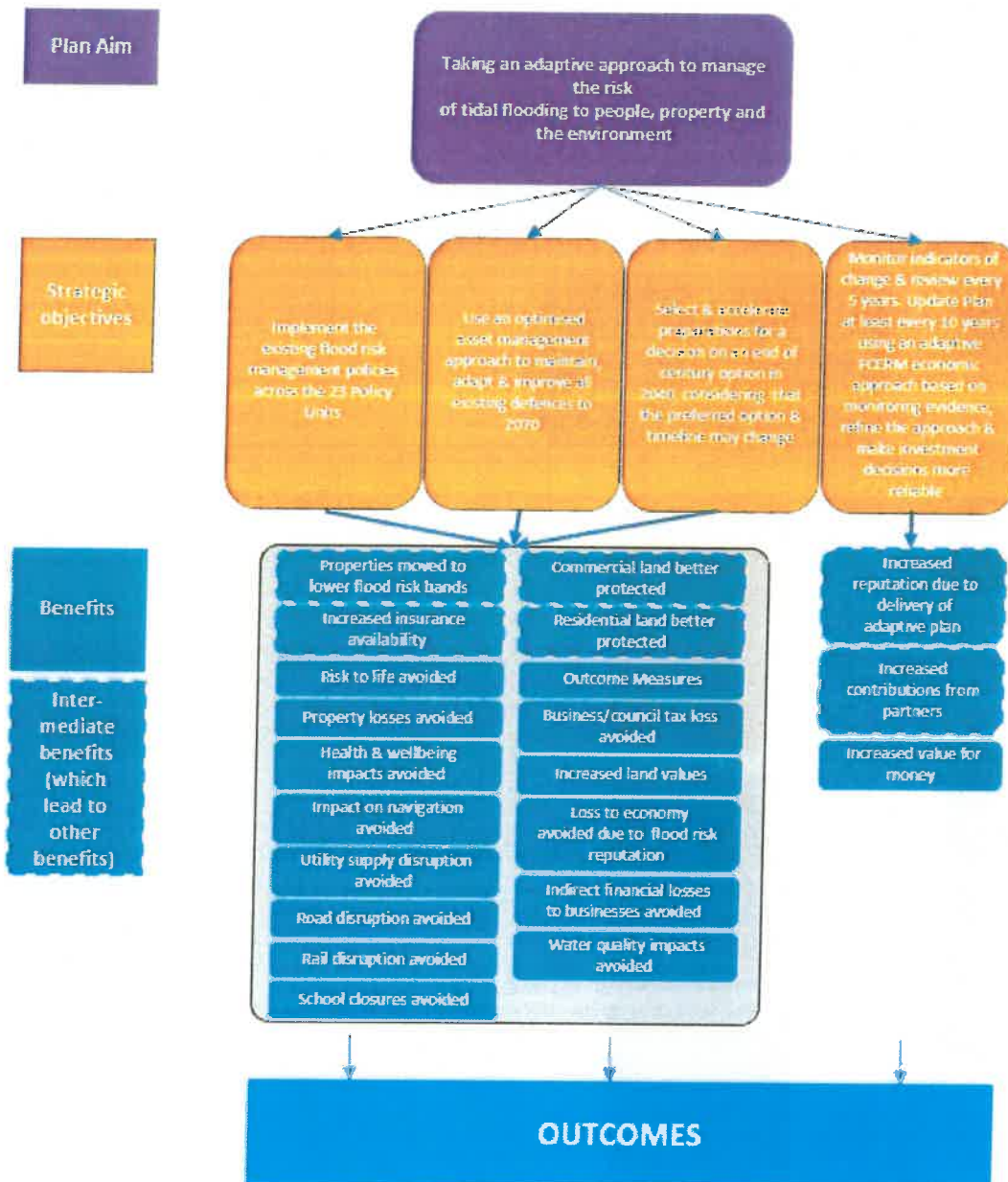


Image: A diagram showing the strategic objectives and benefits linked to the aim 'taking an adaptive approach'

Aim: Taking an adaptive approach to manage the risk of tidal flooding to people, property and the environment

Linked strategic objectives:

- Implement the existing flood risk management policies across the 23 Policy Units



- Use an optimised asset management approach to maintain, adapt & improve all existing defences to 2070
- Select & accelerate preparations for a decision on an end of century option in 2040, considering that the preferred option & timeline may change
- Monitor indicators of change & review every 5 years. Update Plan at least every 10 years using an adaptive FCERM economic approach based on monitoring evidence, refine the approach & make investment decisions more reliable

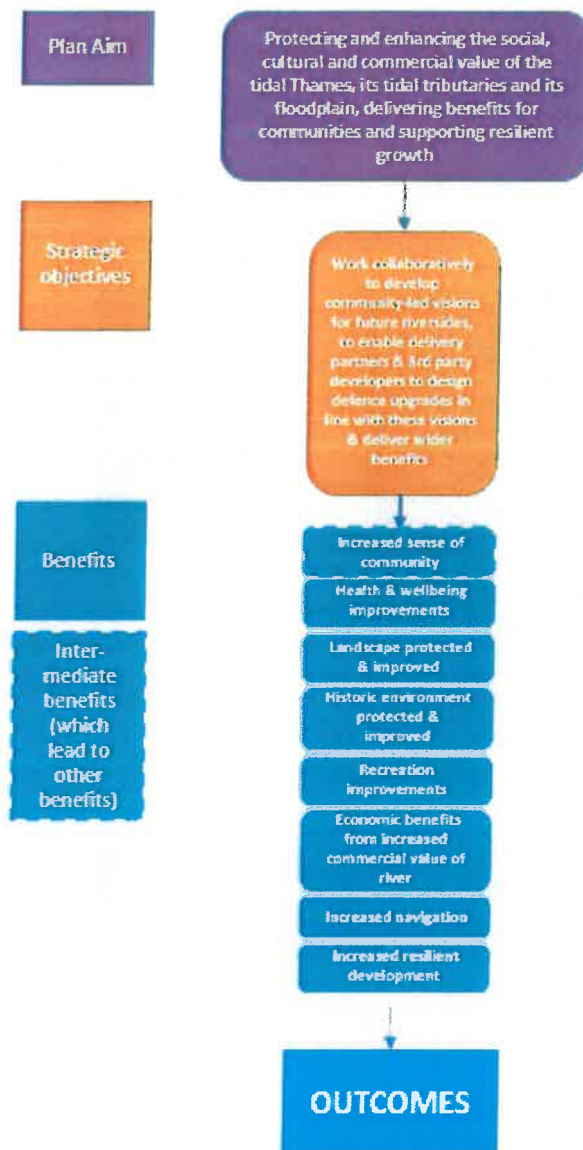


Image: A diagram showing strategic objectives and benefits linked to the aim 'protecting and enhancing the social, cultural and commercial value of the tidal Thames...'



Aim: Protecting and enhancing the social, cultural and commercial value of the tidal Thames, its tidal tributaries and its floodplain, delivering benefits for communities and supporting resilient growth

Linked strategic objectives:

- Work collaboratively to develop community-led visions for future riversides, to enable delivery partners & 3rd party developers to design defence upgrades in line with these visions & deliver wider benefits

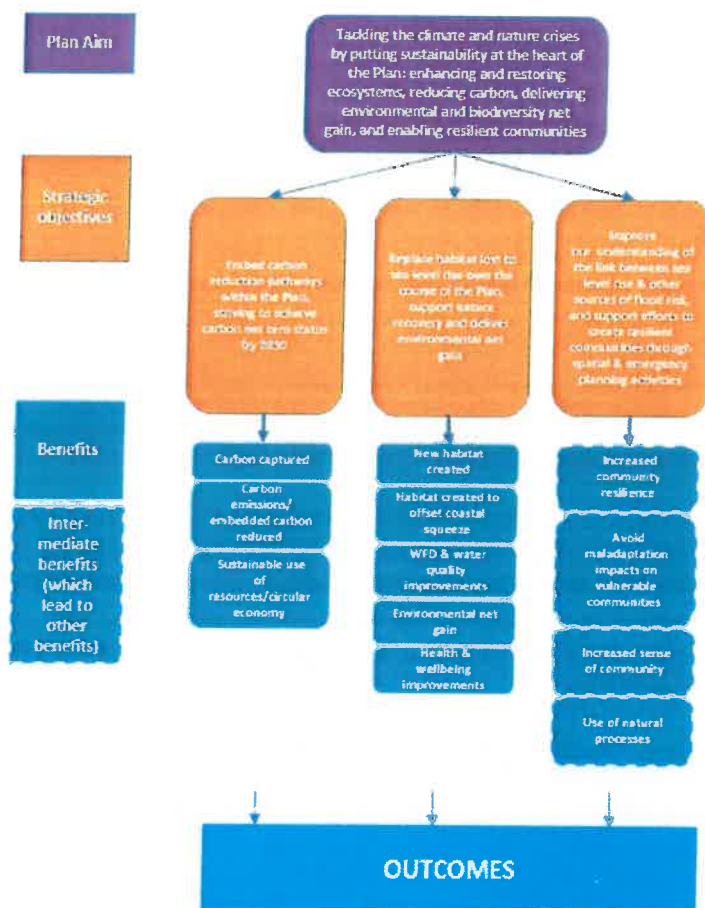


Image: A diagram showing strategic objectives and benefits linked to the aim 'tackling the climate and nature crises by putting sustainability at the heart of the Plan...'

Aim: Tackling the climate and nature crises by putting sustainability at the heart of the Plan: enhancing and restoring ecosystems, reducing carbon, delivering environmental and biodiversity net gain, and enabling resilient communities

Linked strategic objectives:



- Embed carbon reduction pathways within the Plan, striving to achieve carbon net zero status by 2030
- Replace habitat lost to sea level rise over the course of the Plan, support nature recovery and deliver environmental net gain
- Improve our understanding of the link between sea level rise & other sources of flood risk, and support efforts to create resilient communities through spatial & emergency planning activities

Underpinning all of this are 'strategic enablers'. These help us to support our partners to deliver the Plan's objectives.

These are:

- Developing a long-term investment strategy, which will enable us to deliver the Plan's benefits and realise the financial benefits of an adaptive strategy
- Developing a land strategy for the estuary and putting it into place to ensure land is secured to deliver the Plan

We have recently worked with our partners to reshape what we need to do collectively to achieve these benefits. We refer to these as the 'outcomes' of the Plan. For example, 'The riverside strategy approach and Thames Estuary 2100 requirements are embedded in the statutory spatial planning framework, increasing opportunities, efficiency and effectiveness of delivering defence upgrades and multiple benefits through development of the riverside.' These updated outcomes form the majority of this consultation.

Towards the end of this year, we will consider the outputs of this consultation with our partners, and refine them further, ahead of publishing them in the updated Plan in the first half of next year. After the updated Plan is published, we will develop specific plans with our partners which set out which on-the-ground actions need to be put in place, by when, and by whom. We call these plans 'outcome delivery plans'. These plans will enable us to measure and track delivery of the objectives and outcomes in the updated Plan.

Once we have produced the updated Plan, we will be developing a benefits realisation plan which lists out benefits, owners, and measures which will enable us to collectively track and manage delivery of the Plan and its benefits. We will start working with partners on this later this year.



Outcomes in the updated Thames Estuary 2100 Plan

An 'outcome' refers to what we (the Environment Agency) and our partners need to do to manage tidal flood risk in the estuary. Most of these outcomes describe this for the whole estuary, although some outcomes are specific to a certain location based on physical characteristics. These outcomes will form the main part of the updated Thames Estuary 2100 Plan, and will be a key part of this consultation.

After the updated Plan is published, we will focus on developing an 'outcome delivery plan' with our partners. This plan will include the actions required to achieve the outcomes, which organisations and/or landowners need to deliver them, dates by when they need to be in place and how we will measure progress. We will be starting this work towards the end of this year.

8. What level of detail do you think the updated Plan should include?

Please select all that apply

- The outcome required to be delivered
- Who is responsible for delivering it
- The deadline for when it is required
- The steps required to achieve it
- Who else needs to be involved to deliver it
- All of the above
- Other

If you selected 'other', please explain your answer here.

Flood & coastal risk management outcomes

Taking an adaptation pathways approach to flood risk management

The Thames Estuary 2100 Plan aims to adapt to rising sea levels within the estuary over the next 100 years and beyond. This is done by applying policies to different areas of the estuary, known as Policy Units, based on social, economic and environmental factors. These policies are shown in the map below. The flood risk management policies dictate how the overall tidal defence network should be managed in different parts of the estuary – such as through defence raising and setback of current defence lines in response to rising sea levels. They are defined as:

P3 – Maintain flood defences at their current level accepting likelihood and/or consequences of a flood will increase with climate change

P4 – Ensure flood defences keep pace with climate change so that flood risk does not increase



P5 – Improve flood defences to reduce the risk of flooding (now or into the future)

Thames Estuary 2100 Policy Management Units

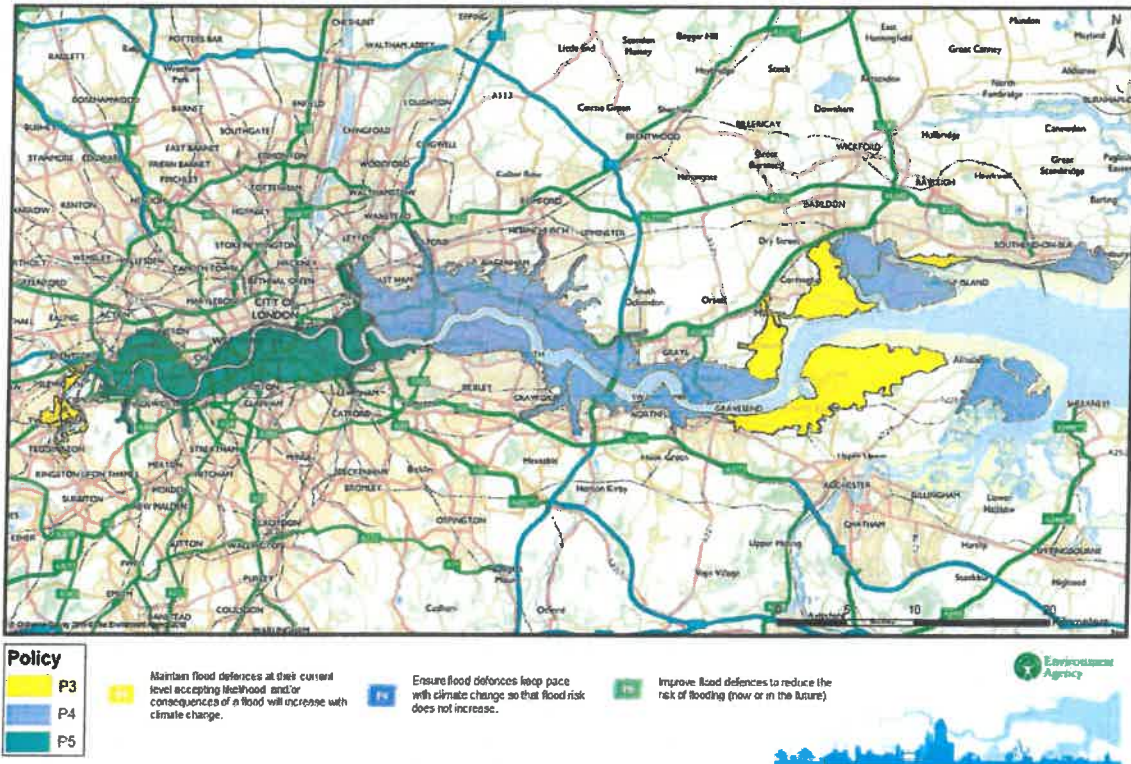


Image: Map of the areas covered by each of the flood risk management policies

As the rate of climate change and sea level rise is uncertain, the Thames Estuary 2100 Plan also sets out a series of 'pathways', identifying decisions for managing tidal flood risk that need to be taken now, and those which should be made in the future, ensuring that decisions are informed by the best possible data and evidence. The Plan is monitored every 5 years and updated every 10 years as part of this process. Currently, the Plan identifies several options to protect the Thames Estuary to the end of the century and beyond, which we expect to be in place by 2070:

- Upgrading the existing Thames Barrier and wider defence system
- Constructing a new Thames Barrier and upgrading the wider defence system
- Introducing multiple flood storage areas alongside the existing Thames Barrier, and upgrading the wider defence system

As sea level continues to rise, we will need to adapt the system further and add a second set of gates and a lock structure to the barrier. This is expected to be needed by 2120.

It is important to note that these options, or the dates when they are required will not change as part of this consultation. We will work with our partners to decide on an end of century option by 2040.

The estuary contains over 3000 defences covering 300 kilometres, as well as several major barriers other than the Thames Barrier. This system needs to be maintained and upgraded by the relevant



organisations and landowners. To make this happen, all flood defence owners need to play their part across the estuary, as the Environment Agency is only responsible for 12% of these defences by number.

Resilience

Nationally, we are likely to see nearly double the number of properties in the floodplain over the next 50 years. Predictions also show that by 2050 we could see 59% more winter rainfall and once-a-century sea level events could become annual events by 2100. As sea level continues to rise, more people are living in the floodplain and flood defences age over time, it is more important than ever before to improve community resilience to flooding in the estuary. We can never prevent all flooding from happening, however, we can reduce the consequences by increasing awareness and our ability to adapt, respond and recover. It is important to ensure those who are actively involved in improving their own resilience in their local area are involved in decision making and maximising resilience benefits.

The 2020 National Flood and Coastal Erosion Risk Management Strategy defined flood and coastal resilience as the capacity of people and places to plan for, better protect, respond to, and recover from flooding and coastal change. This includes making the best land use and development choices, protecting people and places, responding to and recovering from flooding and coastal change whilst all the time adapting to climate change.

Flood risk management policies

The Thames Estuary 2100 Plan applies flood risk management policies to different areas of the estuary (known as Policy Units), based on social, economic and environmental factors in those areas. Policy 3 is defined as 'maintain flood defences at their current level accepting likelihood and/or consequences of a flood will increase with climate change'. As the frequency of storm events increases and sea level continues to rise over the course of the century, it is likely that flooding will occur more often in policy 3 areas. It is critical that flood risk management authorities and communities work together to put measures in place to increase local resilience. For example, this could include creating emergency flood plans, raising awareness of what to do in a flood, and installing property resilience measures.

Other sources of flood risk

In addition to tidal flood risk, the Thames Estuary is also at risk of fluvial and surface water flooding. Although the primary purpose of the Thames Barrier is to protect the estuary from tidal flooding, when river flows are extremely high, the Thames Barrier can be closed to prevent the tide from entering London. This creates space for fluvial water to flow into the tidal Thames, preventing water from backing up and reducing the risk of flooding to some low-lying properties in the West London area.

We set a limit on the number of average annual closures of the Thames Barrier. The more frequently the Barrier closes, the more costly it is to maintain over the longer term to ensure it can operate effectively when we need it to. We expect to need to close the Barrier more



frequently as sea level rises. If we continue to use the Barrier to manage fluvial flood risk, the average annual number of closures would increase too quickly. This would mean that we would need to raise the defences upstream of the Barrier sooner.

We are developing modelling which can help us to better understand the interactions between tidal and fluvial flows in West London. Once this is complete, we will be looking at alternative options to the Thames Barrier to manage fluvial flood risk in this area. Working in partnership is key in the Thames Estuary 2100 Plan. We will work with our partners and local communities to implement other flood risk management measures in this area to reduce reliance on the Thames Barrier (see outcome 2c).

Furthermore, the Environment Agency will work with lead local flood authorities and utility providers (such as Thames Water) to tackle the increasing risk of blocked drainage outfalls as a result of sea level rise.

What are the flood risk management policies in the Thames Estuary 2100 Plan?

The Thames Estuary 2100 Plan sets out three different policies for managing flood risk. These are:

- Policy 3 (P3): Maintain flood defences at their current level accepting likelihood and/or consequences of a flood will increase with climate change
- Policy 4 (P4): Ensure flood defences keep pace with climate change so that flood risk does not increase
- Policy 5 (P5): Improve flood defences to reduce the risk of flooding (now or in the future)

9. Tidal defence network

Outcome 1a: Flood and coastal defence owners continue to maintain and improve defences across the Thames Estuary. Defences will be adapted, raised, realigned or replaced as required by the flood risk policies of the Thames Estuary 2100 Plan, ensuring resilience to climate change whilst demonstrating best value for money. This should be integrated with development of the riverside where possible, and always seek to deliver multiple benefits.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.



10. Tidal defence network

Outcome 1b: Flood walls and embankments will be raised to prepare for sea level rise:

- Defences downstream of the Thames Barrier will need to be raised by 2040 – refer to the relevant policy unit for specific requirements, deadlines and opportunities
- Defences upstream of the Thames Barrier will need to be raised by 2050
- Further defence raising across the estuary will be required towards the end of the century

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

11. Tidal defence network

Outcome 1c: The Environment Agency will maintain our major barriers in the estuary across the estuary and adapt to sea level rise by optimising their operation, ensuring resilience to climate change and creating long-term plans for upgrade, replacement, realignment or decommissioning.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome



If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

12. Tidal defence network

Outcome 1d: Flood and coastal defence owners will maintain all gates, outfalls and pumping stations across the estuary and adapt to sea level rise by optimising their operation, ensuring resilience to climate change and creating long-term plans for upgrade, replacement, realignment or decommissioning.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

13. Thames Barrier

Climate change and sea level rise means the number of Thames Barrier closures is likely to significantly increase in the coming decades. It is important to prolong the lifespan of the Thames Barrier until 2070.

Outcome 2a: The Environment Agency will maintain the Thames Barrier to ensure it operates reliably and effectively as part of the wider flood defence system, working alongside the Port of London Authority to enable navigation.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome



If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

14. Thames Barrier

Outcome 2b: The Environment Agency will seek to improve the accuracy of tidal forecasting in the Thames Estuary, to reduce the number of precautionary closures of the Thames Barrier and other major barriers in the estuary.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

15. Thames Barrier

Outcome 2c: The Environment Agency will use the Thames Barrier, alongside the other defences in the estuary, to manage tidal surges and more significant fluvial events. The Environment Agency will work with partners to identify areas that currently benefit from closing the Thames Barrier during fluvial flow events. In these areas, the Environment Agency will work with local communities and partners to agree and put alternative flood risk management measures in place for smaller fluvial events, to reduce the number of Thames Barrier closures for fluvial flow events by 2035.

Note: More significant fluvial events are fluvial flows of 600 cubic metres or higher in combination with mean high water spring tides.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended



- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

16. End of century options

Outcome 3a: Take a decision by 2040 on the end of century option for adapting to sea level rise, using the latest data and evidence. The Environment Agency will create a roadmap of the actions required to improve confidence and understanding of selecting an option.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

17. End of century options

Outcome 3b: By 2030, the Environment Agency will review the end of century option ahead of the next Plan update. This may involve altering or discounting options that are no longer viable or value for money.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome



If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

18. Future pathway - beyond 2100

Outcome 4: A barrier with locks will be required to adapt to further sea level rise. This is expected by 2120 based on current climate change projections, but this date may change as new evidence emerges.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

19. Other sources of flood risk

Outcome 5a: The Environment Agency and lead local flood authorities collaborate to improve management of the interface between tidal, fluvial, and surface water flood risk.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.



20. Other sources of flooding

Outcome 5b: The Environment Agency and lead local flood authorities collaborate to better understand and manage the flood risk caused by tide locking of outfalls and other defences.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

21. Other sources of flooding

Outcome 5c: The Environment Agency, and lead local flood authorities and water companies manage tidal and other sources of flood risk more effectively by embedding Thames Estuary 2100 outcomes in Local Flood Risk Management Strategies, Flood Risk Management Plans, Drainage and Wastewater Management Plans, Surface Water Management Plans and other relevant plans.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.



22. Community resilience

Nationally, we are likely to see nearly double the number of properties in the floodplain over the next 50 years. Predictions also show that by 2050 we could see 59% more winter rainfall and once-a-century sea level events could become annual events by 2100. As sea level continues to rise, more people are living in the floodplain and flood defences age over time, it is more important than ever before to improve community resilience to flooding in the estuary. We can never prevent all flooding from happening, however, we can reduce the consequences.

The 2020 National Flood and Coastal Erosion Risk Management Strategy defined flood and coastal resilience as 'the capacity of people and places to plan for, better protect, respond to, and recover from flooding and coastal change'. This includes making the best land use and development choices, protecting people and places, responding to and recovering from flooding and coastal change whilst all the time adapting to climate change.

The Thames Estuary 2100 Plan applies flood risk management policies to different areas of the estuary (known as Policy Units), based on social, economic and environmental factors in those areas. Policy 3 is defined as 'maintain flood defences at their current level accepting likelihood and/or consequences of a flood will increase with climate change'. As the frequency of storm events increases and sea level continues to rise over the course of the century, it is likely that fluvial flooding will occur more often in policy 3 areas. The flood defences in the estuary provide a high standard of protection, however, it is critical that flood risk management authorities and communities work together to put measures in place to increase local resilience. For example, this could include creating emergency flood plans, raising awareness of what to do in a flood, and installing property resilience measures. It is important to ensure those who are actively involved in improving their own resilience in their local area are involved in decision making and maximising resilience benefits. We want to understand your current level of resilience and your views on community resilience.

Outcome 6a: Increase resilience to the impacts of flooding by raising community awareness and the ability to adapt, respond, and recover, particularly in areas where flood risk will increase over time with climate change. See Policy Unit specific outcomes for where this is expected.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.



23. Community resilience

Outcome 6b: People living and working in the Thames Estuary 2100 Plan area have an increased awareness and ownership of tidal flood risk and are empowered to build resilience within their communities.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

24. Please answer this question if you live within the Thames Estuary. To what extent do you agree with this statement: 'My community is resilient to flood risk and the impacts of climate change'.

	Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree
My community is resilient to flood risk and the impacts of climate change.					

Please explain your answer. Please also describe the location of the community you live in.

25. Are you aware of any initiatives to improve resilience to flood risk or the environment in your local area?



Delivering the Thames Estuary 2100 Plan

26. Do you understand your responsibilities to deliver the Plan?

Please select only one item

- Yes
- No
- Unsure

If you said yes, please explain your responsibilities. If you said no or unsure, please add any comments here.

27. What are you already doing to deliver on these responsibilities?

28. What kind of guidance and tools do you need to support you achieving these responsibilities?

29. What are the biggest challenges to delivering the Plan, and why?

30. Do you understand why the deadlines in the Plan change as new data and evidence becomes available?

Please select only one item

- Yes
- No



- Unsure

If you selected no or unsure, what additional information would help to clarify this?

31. What plans and strategies should align with, or be embedded within the updated Thames Estuary 2100 Plan?

32. To what extent do you support the outcomes proposed for managing other sources of flood risk?

Please only answer this question if you are responding on behalf of a flood risk management authority, for example, a local council or service provider.

	Strongly disagree	Somewhat disagree	Neutral	Somewhat support	Strongly support
To what extent do you support the outcomes proposed for managing other sources of flood risk? <i>Please select only one item</i>					

33. How could we improve the outcomes proposed for managing other sources of flood risk?
Please only answer this question if you are responding on behalf of a flood risk management authority, for example, a local council or service provider.

Place-making and climate resilient growth

Climate resilient growth



One of the main ways of achieving climate resilient places is to ensure sustainable growth and development in the right places. Alongside local planning authorities, we have a key role in engaging and advising developers to avoid inappropriate development in flood risk areas and enable climate resilient development.

Effective spatial planning is an essential tool for making land use choices that help to achieve greater flood and coastal resilience, as well as wider environmental benefits. Good place-making and enabling climate resilient growth are therefore central themes in the Thames Estuary 2100 Plan, which can be achieved by integrating flood risk management with long-term visions for the riverside.

34. Climate resilient growth

Outcome 7: New and existing development within the Thames Estuary 2100 Plan area is resilient to tidal flood risk caused by sea level rise. Inappropriate development in flood risk areas is avoided.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

35. Delivering multiple benefits through place-making

The Thames Estuary 2100 Plan promotes a riverside strategy approach. This approach advocates that local councils and others with a role in shaping the future of the riverside work with communities to develop a vision to integrate raised flood defences into the surrounding landscape. This will create higher quality public and private spaces that are greener, with better access to the riverside, improved views of the river, and a continuous Thames Path.

Outcome 8a: Councils, communities and other local organisations take a proactive approach to managing future climate risks through place-making, by developing visions for how their riverside will adapt to sea level rise and become more climate resilient.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome



If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

36. Delivering multiple benefits through place-making

Outcome 8b: The riverside strategy approach and Thames Estuary 2100 requirements are embedded in the statutory spatial planning framework, increasing opportunities, efficiency and effectiveness of delivering defence upgrades and multiple benefits through development of the riverside.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

37. Delivering multiple benefits through place-making

Outcome 8c: Improve sustainable recreational river use and access, through delivering defence upgrades and multiple benefits in line with the riverside strategy approach.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.



38. Thinking about the Thames Estuary riverside, what do you value the most? What improvements would you like to see in the future? Please refer to specific locations where possible.

39. Do you support the principle of a riverside strategy approach to integrate flood risk management with wider improvements to the riverside?

The riverside strategy approach advocates that local councils and others with a role in shaping the future of the riverside work with communities to develop a vision to integrate raised flood defences into the surrounding landscape. For example, this could mean creating improved access to the river for recreational activities, new green spaces or habitat creation.

Please select only one item

- Yes
- No
- I don't know

Please explain your answer.

40. What guidance do you need to deliver the riverside strategy approach or to support it in your area?

41. Visions for the future of the riverside could be at any scale. Are you aware of any opportunities to develop these visions? For example, community groups, upcoming development or renewal of spatial planning documents.

Please select only one item



- Yes
- No
- Unsure

If you said yes, please give details of the opportunities you are aware of.

42. Land strategy

In order to adapt for the future in line with the riverside strategy approach, we need to ensure that the land required to do so is available when we need it. It is important that land is also secured to implement an end of century option, expected to be in place by 2070. This means that land needs to be secured in advance, which could be done through land purchase, negotiation or legal agreement. Securing land early means we can reduce the level of disruption that may be experienced by landowners and other stakeholders that would occur if we left securing land until a later point.

We are carrying out work to develop a technical evidence base for where and which land needs to be secured for the end of century options. This evidence will help us to develop a plan for securing the land that could be required.

Outcome 9a: Secure land across the estuary to enable defence upgrades and realignment for associated riverside enhancements, habitat and biodiversity improvements, and the end of century option to adapt to sea level rise.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

43. Land strategy

Outcome 9b: The Environment Agency will work with partners to develop a land strategy setting out how, when and where to secure land by 2030.



Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

Securing investment to deliver the Plan

We recently worked with our partners to identify multiple benefits beyond flood risk that the Thames Estuary 2100 Plan can deliver. We used these benefits to create a new structure for the updated Plan that provides a clear line of sight from the Plan's aims to the outcomes that describe what we need to do to deliver them.

Government grant in aid funding is allocated to us (the Environment Agency) and other risk management authorities for flood and coastal risk management schemes and strategies. Government Partnership Funding rules state that contributions must be secured from those benefitting from flood schemes. This applies to all the work we carry out across Thames Estuary 2100.

We are looking to work in partnership with beneficiaries throughout the Thames Estuary, to explore opportunities to collaborate and secure the funding required to help manage their tidal flood risk. We need to work together to develop a long-term, sustainable investment strategy to fund the Plan. This strategy will use the benefits-led approach to identify others who benefit from achieving the outcomes in the Plan, and therefore who we will need to work with to deliver each benefit. Some benefits are solely 'owned' by other organisations, who are therefore responsible for funding and delivering the related outcomes.

There are significant opportunities to work together to do this, particularly if we look outside of solely flood risk and consider other benefits that can be achieved through the reshaping of our riverside, such as providing better access to the riverside, improving infrastructure, and creating new green spaces and habitat.

44. Investment

Outcome 10: The Environment Agency will work with partners to develop an investment plan by 2025 to deliver the flood and coastal defence upgrades required by the Thames Estuary 2100 Plan. This will include long-term finance options to ensure efficient and



effective investments and shall set out the required milestones in the short, medium and long-term.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

45. What mechanisms should we be exploring to secure the required investment to deliver the Plan?

Please select all that apply

- Council tax levy
- Private investment
- Business tax
- Green bonds
- Insurance/reinsurance levy
- Other

If you selected 'other', please explain your answer here.

What is a levy?

A levy is an amount of money that must be paid and that is collected by a government or other authority.

46. Do you have any examples of where these investment models have been used before?

47. Do you or your organisation have any expertise in this area and would be willing to contribute to developing the investment strategy for the Thames Estuary 2100 Plan?

Please select only one item

- Yes



- No
- I don't know

If yes, please provide a summary of relevant expertise here.

48. What should the Thames Estuary 2100 Plan deliver? Please rank these in priority order. (1 being highest)

Managing the impacts of tidal flood risk and adapting to climate change	
Environmental improvements	
Amenity improvements	
Enabling economic and commercial opportunity	
Community resilience	
Enabling river use	
Protecting critical infrastructure (transport, hospitals, utilities)	
Other	

If you selected 'other', please explain your answer here.

Sustainability and monitoring

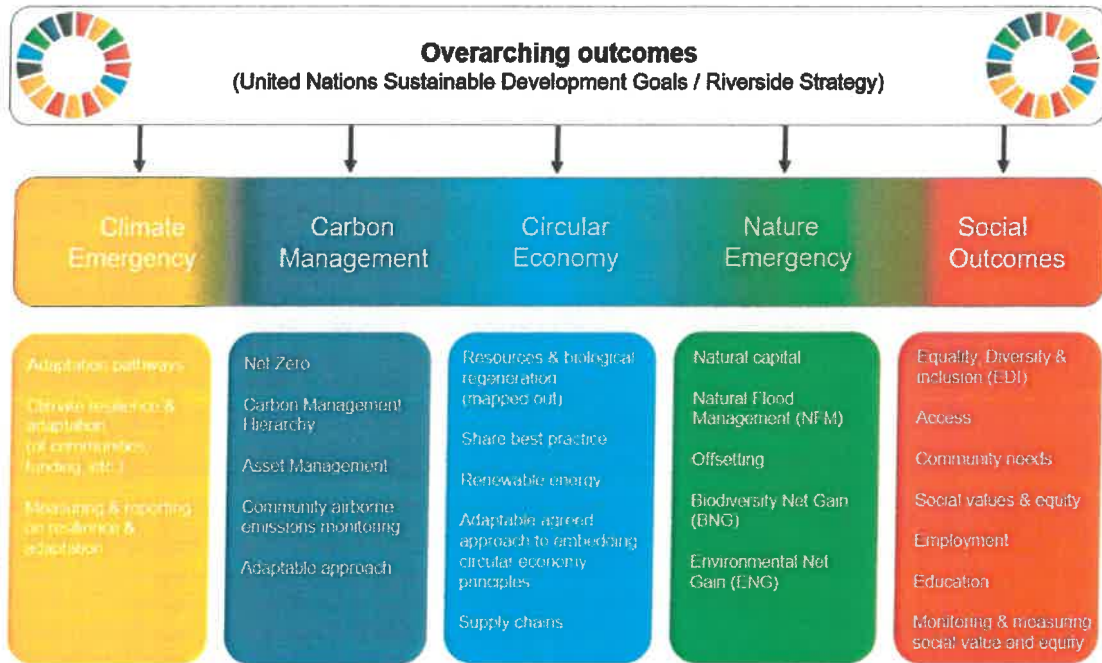
We have developed a sustainability framework for the Plan, which reflects the need to tackle the climate and nature emergencies and the ambition to deliver social value for communities. Certain elements of the framework, such as legal compensatory habitat and biodiversity net gain (BNG) are mandatory requirements from the Environment Act 2021.

Within this are five key sustainability themes as shown in the diagram below:

- the climate emergency
- carbon management
- circular economy
- nature emergency
- social outcomes

These five themes are based on sustainability legislation, standards, government policies/objectives, and partner's plans, as well as consultation with key partners.

The proposed outcomes will enable us to deliver sustainability benefits within these five themes.



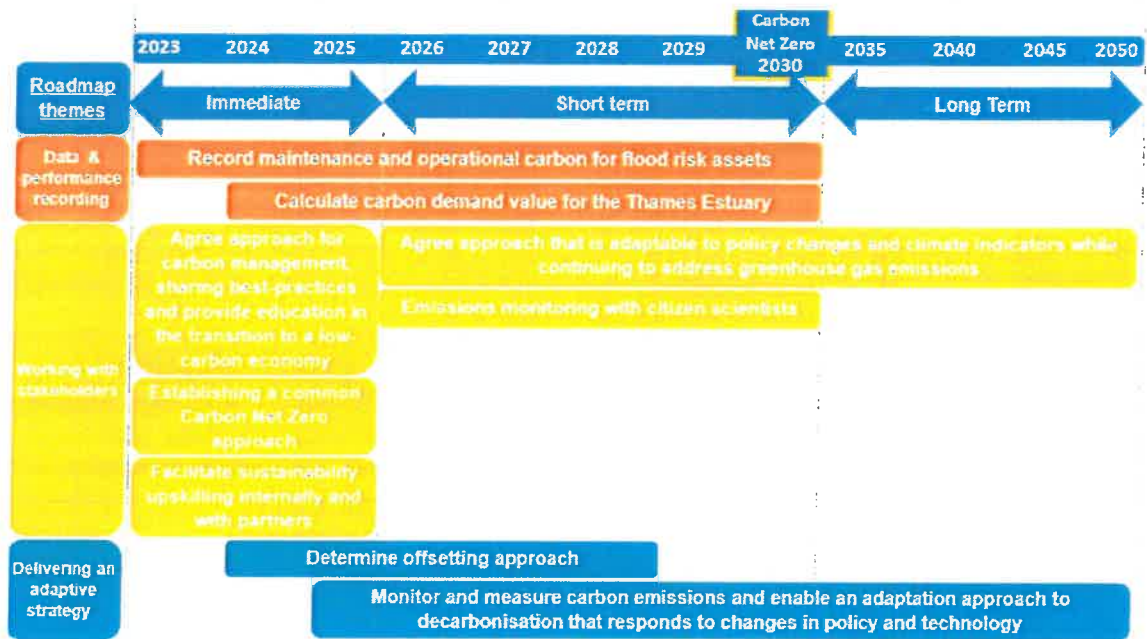
49. Carbon management

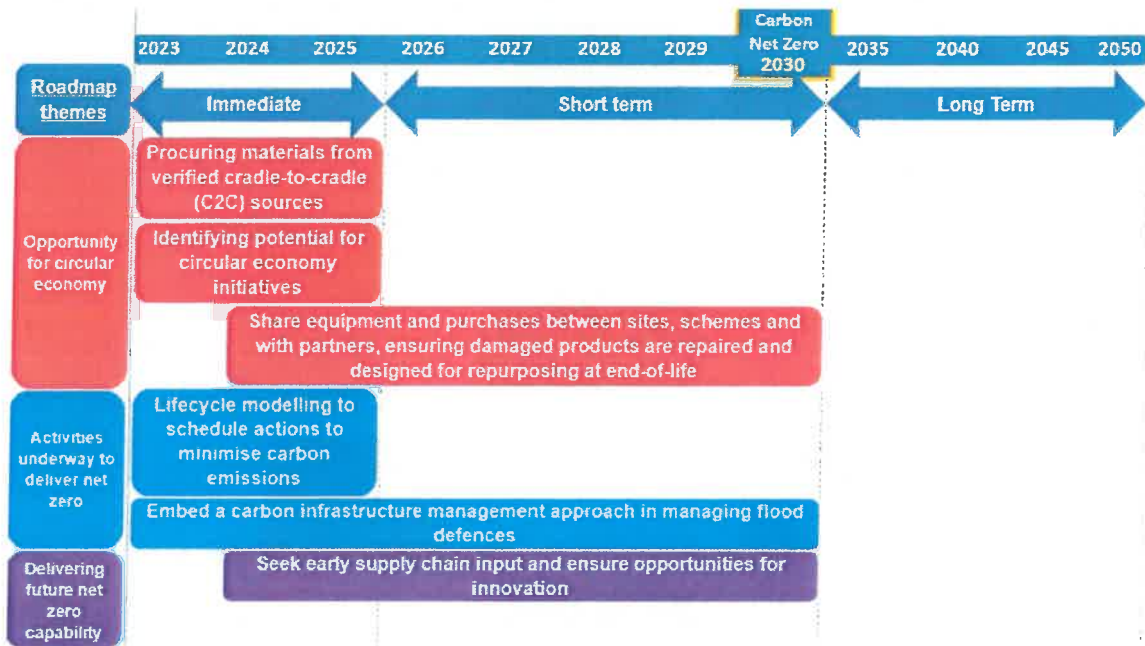
Carbon net zero means balancing the carbon emissions we produce with those we take out of the atmosphere. By doing this, we are no longer contributing to climate change. The Climate Change Act sets out a requirement to reach carbon net zero by 2050. The Environment Agency and many of our partners aim to reach carbon net zero by 2030. As part of the 10-Year Review, we have developed a roadmap for reaching carbon net zero. It explains what this means in the context of the Thames Estuary 2100 Plan and sets out the Plan's strategic ambition to reach net zero by 2030. It is important that we work with our partners to establish how we can collectively achieve this.

The roadmap includes 6 key themes (see below).



We have developed a Net Zero Roadmap for the updated Plan which captures the immediate, short term, and long-term actions under each theme for delivering carbon net zero up to 2030 and beyond as we look to reduce emissions further (see below).





Outcome 11a: All partners will work together to achieve carbon net zero in our operations and supply chains.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

50. Circular economy

Establishing a circular economy approach (improving resource efficiency) preserves natural resource and lowers the production of waste and emissions. This reduces the use of new materials, keeps materials in circulation at the highest value for longer and supports sustainable sourcing. It also supports nature regeneration and reduces the production of waste and emissions through renewable energy sources.

Outcome 11b: All partners will adopt a circular economy approach by improving resource efficiency and minimising emissions and waste, to provide better value for money and improve air, land and water quality.

Please select only one item



- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

51. Is your organisation aiming to achieve carbon net zero?

Please select only one item

- Yes
- No
- I don't know

If yes, by when? Could there be opportunities for your organisation to collaborate with Thames Estuary 2100 on this?

52. Do you have any feedback on how we could improve/align the roadmap to net zero with your organisation's ambitions and approach to achieving net zero carbon?

53. Are you or your organisation currently working towards (or planning to work towards) a circular economy approach?

Please select only one item

- Yes
- No
- I don't know



If yes, please detail which Circular Economy elements that you/your organisation is implementing. Please briefly explain how you/your organisation is implementing these elements.

54. What are your priorities for increasing social value within your local community/area of the Thames Estuary?

Social value encompasses environmental, economic and social wellbeing and understands each of these in terms of their impact on the quality of life of people. We aim to deliver social value with our partners and local communities through creating resilience to flooding, thriving blue and green spaces, accessible recreational space, and support wider community initiatives where possible.

At a delivery level, the Plan will seek out opportunities to drive sustainable supply chains as well as promote improved social value through employment opportunities in this sector.

Please tell us what your priorities for increasing social value are by selecting all those that apply in the list below.

Please select all that apply

- Volunteering/charity/internship/apprenticeship
- Citizen Science involvement (e.g., monitoring emissions, water quality etc.)
- Attractive, quiet and restful stopping places (e.g., Pollinator Parks, Climate Gardens)
- Recreational and educational blue/green space (e.g., wetland centres, skate parks, playgrounds, learning zones etc.)
- Blue and green habitat restoration (e.g., creating habitats for nature recovery)
- Cultural and arts space (e.g., LED light display, open-air exhibits)
- Educational training schemes in schools (e.g., Science, Technology, Engineering and Mathematics Ambassador)
- Diversifying supply chains to new green suppliers
- Infrastructure for protected characteristics (e.g., wheelchair or disability access, suitable lighting)
- Recreation infrastructure (e.g., bike/pedestrian shelters)
- Other

If you selected 'other', please explain your answer here.



55. Nature emergency

Natural habitats support flood risk management and resilience, biodiversity and landscape, help improve air, land and water quality and capture carbon. They also provide recreational, volunteering, and educational opportunities.

We need to work with our partners and communities in the estuary to address the climate and nature emergencies that we currently face. We can do this by protecting and enhancing habitats in the estuary.

Outcome 12a: The Environment Agency will work with partners to enable nature recovery and develop biodiversity resilience, by delivering biodiversity and environmental net gain and minimising adverse environmental impacts. This includes creating new habitat to compensate for coastal squeeze in advance of projected losses.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

56. Nature recovery

Outcome 12b: Flood and coastal defence owners ensure defence upgrades and realignment create continuous or semi-continuous blue and green habitat corridors in line with local nature recovery strategies, to maximise biodiversity benefits, and create educational, volunteering and recreational opportunities.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.



57. Monitoring habitats

Outcome 12c: The Environment Agency will work with partners and communities to monitor habitats. Monitoring should include quality as well as quantity, changes in fauna and flora, blue and green habitat connectivity, and the habitat's contribution to natural flood management, to ensure the success of biodiversity improvements across the estuary.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

58. Are you or your organisation involved with creating or maintaining blue and green spaces, increasing biodiversity and/or improving habitats in your community/area?

Please select only one item

- Yes
- No
- I don't know

If yes, would you/your organisation be interested in collaborating on this with Thames Estuary 2100?

If not, would you/your organisation like to collaborate with Thames Estuary 2100 on this in the future? Please tell us what you'd be interested in.



59. Monitoring changes in the estuary

The adaptive approach within the Thames Estuary 2100 Plan is driven by the latest climate science and data. We regularly monitor changes in the estuary, alongside climate projections, to ensure we can make well-informed decisions on which flood risk management options are most appropriate when we review and update the Plan.

Based on the key findings of the 10-Year Review Monitoring Review, we have updated the climate change projections used in the Thames Estuary 2100 Plan to use the highest rate of sea level rise from updated UK climate change projections (UKCP18).

We aim to collaborate with our partners and community organisations to collect data which is mutually beneficial to increase the efficiency of our monitoring. This includes citizen science and creating new educational opportunities in schools and colleges. Data collection might include taking water samples, counting wildlife or recording changes in vegetation or geomorphology. This will be shared as open data.

Outcome 13: The adaptive approach within the Plan is driven by latest science and data. Changes in the estuary and climate change effects are monitored by the Environment Agency in collaboration with partner and community organisations to ensure efficient, mutually beneficial data collection that is shared as open data.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

60. Do you/your organisation monitor changes in the estuary (e.g., physical, social, environmental changes)?

Please select only one item

- Yes
- No
- I don't know

If not, what would encourage you to do this?



61. Do you/your organisation use data sharing or collaboration platforms that could be useful for monitoring data?

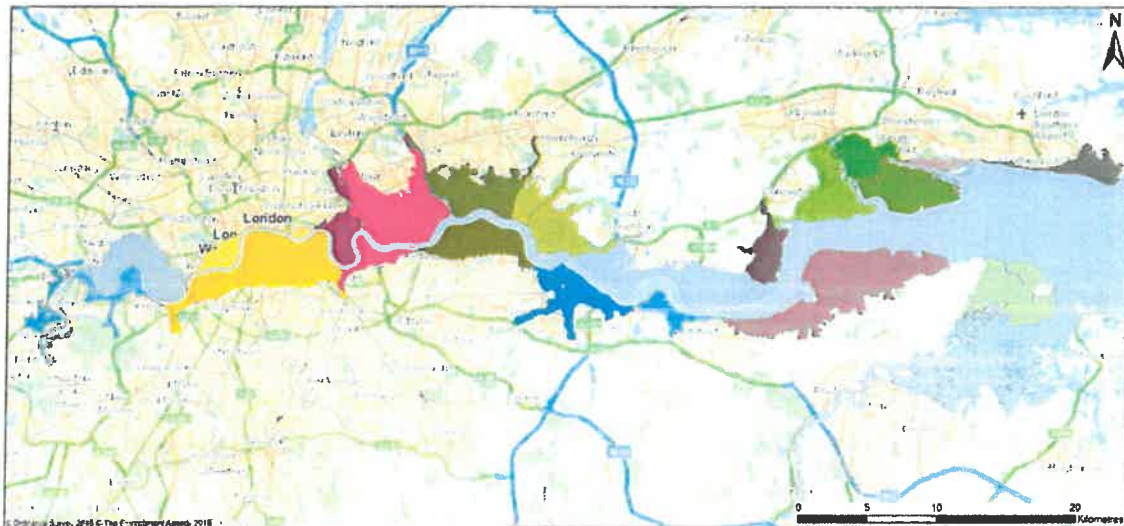
Please select only one item

- Yes
- No
- I don't know

If yes, please describe which platforms you/your organisation uses.

Policy Unit specific outcomes

The Thames Estuary 2100 Plan applies policies to different areas of the estuary (known as Policy Units), based on social, economic, and environmental factors. There are 23 Policy Units in the Plan (see below).



Legend

The Policy Units are 23 geographical areas in Thames Estuary which divide the Plan in manageable action zones. Each area has been assessed to determine the appropriate level of flood risk management.

Richmond	Isle of Dogs & Lea Valley	Dartford & Erith	Canvey Island
Tilkenham	Greenwich	Swanscombe & Northfleet	Bowens Marshes
Barnes & Kew	Royal Docks	Purfleet, Grays & Tilbury	Shoel Haven & Fobbing Marshes
Hammersmith	Thamesmead	East Tilbury & Mucking Marshes	Isle of Grain
Wandsworth to Deptford	Barking & Dagenham	North Kent Marshes	Leigh & Southend
London City	Ravensham Marshes	Hastleigh Marshes	

Many of the outcomes in the Plan apply to the whole estuary. However, in some Policy Units, specific outcomes are needed based on the characteristics of the area. A key example of this local change is in how the flood risk policies of the Plan are implemented. The flood risk management policies dictate how the overall tidal defence network should be managed in different parts of the



estuary – such as through defence raising and setback of current defence lines in response to rising sea levels.

They are defined as:

P3 – Maintain flood defences at their current level accepting likelihood and/or consequences of a flood will increase with climate change

P4 – Ensure flood defences keep pace with climate change so that flood risk does not increase

P5 – Improve flood defences to reduce the risk of flooding (now or into the future)

Below are some examples of Policy Unit specific outcomes, but we would like to hear more from you about where local challenges exist that the Plan can better support on. Click [here](#) for more information about the characteristics of the Thames Estuary Plan's Policy Units.

62. Inner estuary flood defence raising

This outcome applies to all policy units upstream of the Thames Barrier. Please see below to find out more about each Policy Unit.

Outcome 14: Flood and coastal defences will need to be raised to prepare for sea level rise by 2050. Defence owners need to work with the Environment Agency, the relevant local council and infrastructure providers to identify and capitalise on opportunities within this Policy Unit to deliver the upgrades required alongside maximising delivery of multiple benefits.

Policy Unit	Local authority
Greenwich (upstream of the Thames Barrier)	LB Greenwich
Royal Docks (upstream of the Thames Barrier)	LB Newham
Isle of Dogs & Lea Valley	LB Tower Hamlets
Wandsworth to Deptford	LB Lewisham, LB Southwark, LB Lambeth, LB Wandsworth
London City	LB Tower Hamlets, City of London Corporation, LB Westminster, LB Kensington & Chelsea
Hammersmith	LB Kensington & Chelsea, LB Hammersmith & Fulham, LB Hounslow
Barnes & Kew	LB Wandsworth, LB Richmond
Twickenham	LB Hounslow, LB Richmond
Richmond	LB Richmond

Note: LB - London Borough

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome



If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

Greenwich (section upstream of the Thames Barrier)

This policy unit has a P5 policy; to take further action to reduce flood risk. The Greenwich policy unit includes the Millennium village and other redevelopment areas on Greenwich peninsula including the O2 arena, together with North Greenwich underground station and bus terminus. It also contains important historic buildings, including part of maritime Greenwich, which is a World Heritage Site.

The policy unit is a mixture of residential, urban and industrial areas. Like the Isle of Dogs on the north bank, this policy unit is the first major area of redevelopment on the south bank when travelling east from the centre of London.

A key feature of this policy unit is that it straddles the Thames Barrier so when the Barrier is closed against high tides, there is a difference of up to 2 metres either side of the Barrier. To accommodate this difference, the flood defences downstream of the Thames Barrier are up to 2 metres higher than those upstream. This policy unit is at risk of tidal flooding from the Thames upriver of the Thames Barrier, tidal from the Thames downriver of the Thames Barrier and fluvial and tidal/fluvial from the Ravensbourne River.

Royal Docks (section upstream of the Thames Barrier)

This policy unit has a P4 policy; to take further action to keep up with climate change and land use change so that flood risk does not increase. The Royal Docks policy unit forms part of the Thames Gateway regeneration area. The Royal Docks policy unit includes extensive and established residential and industrial areas. It also contains the three Royal Docks, which are a focus for redevelopment and which form a raised strip of land parallel to Woolwich Reach on the River Thames. There are extensive areas of redevelopment planned in this policy unit including much of the area to the south of the Royal Docks.

A key feature of this policy unit is that it straddles the Thames Barrier so when the Barrier is closed against high tides, there is a difference of up to 2 metres either side of the Barrier. To accommodate this difference, the flood defences downstream of the Thames Barrier are up to 2 metres higher than those upstream. It is at risk of tidal flooding from the Thames upriver of the Thames Barrier and from the Thames downriver of the Thames Barrier.

Isle of Dogs & Lea Valley

This policy unit has a P5 policy; to take further action to reduce flood risk. The Isle of Dogs & Lea Valley policy unit has a very high density of development. It includes the Canary Wharf business district and the Olympic Park in the Lea Valley. It also contains extensive residential and industrial areas, and West India and Millwall Docks. Apart from the docks there are few open spaces, and the river frontage is almost continuously developed. This is former industrial land which has seen



major changes in the past 30 years with the development of the Canary Wharf Docklands commercial area.

It is at risk of tidal flooding from the Thames upriver of the Thames Barrier, and tidal and fluvial flooding from the River Lea. There is a medium risk of surface water flooding from rainfall and urban drainage sources in the areas between the docks and the defences.

Wandsworth to Deptford

This policy unit has a P5 policy; to take further action to reduce flood risk. Wandsworth to Deptford has the largest developed area of any of the TE2100 policy units. It is almost continuously developed and includes major urban centres, residential areas, industry, commerce, and some of London's main transport terminals. It is also a very established area and redevelopments are generally relatively small.

Sources of flooding include tidal from the Thames upriver of the Thames Barrier and fluvial from the River Wandle. There is also a risk of surface water flooding from heavy rainfall and urban drainage sources.

London City

This policy unit has a P5 policy; to take further action to reduce flood risk. London City policy unit includes much of Westminster, part of Wapping and a narrow strip along the north bank of the Thames between Charing Cross and London Bridge. The policy unit includes two World Heritage Sites (Palace of Westminster and the Tower of London) and many other historic buildings and scheduled ancient monuments. It is a very established area, with limited redevelopment opportunities.

We have supported the City of London Corporation with the development of their City of London [Riverside Strategy](#). This is the first riverside strategy developed using the principles of the Plan's riverside strategy approach.

It is at risk of tidal flooding from the Thames upriver of the Thames Barrier. It is also at risk of surface water flooding from heavy rainfall and flooding from urban drainage sources, particularly in the Westminster area.

Hammersmith

The selected policy for Hammersmith Policy Unit is policy P5; to take further action to reduce flood risk beyond that required to keep pace with climate change. It is a large and highly developed Policy Unit with extensive and established residential areas. It is also in the reach covered by the Thames Strategy Kew to Chelsea. The estuary frontage is a mixture of public parks, public walkways, roads and private areas. Access to the Estuary is currently not continuous.

Sources of flooding are tidal flooding from the Thames upriver of the Thames Barrier, fluvial flooding from the Thames upriver of the Thames Barrier, surface water flooding from heavy rainfall, and flooding from urban drainage sources.

Barnes & Kew

This policy unit has a P5 policy; to take further action to reduce flood risk. The Barnes & Kew policy unit contains large residential areas, schools and offices. It also has several large open areas



including the Kew Gardens World Heritage Site, Barnes Wetlands Centre and playing fields. There is public access to the whole frontage.

It is at risk of tidal flooding from the Thames upriver of the Thames Barrier, fluvial and tidal/fluvial flooding from the Thames, plus fluvial flooding from Beverley Brook.

Twickenham

Twickenham has two flood risk management policies assigned, due to the complex interaction of tidal and fluvial flood risk in this area. A P3 policy has been assigned to manage fluvial risk (in this case, to seek alternative actions), which acknowledges the need to reduce usage of the Thames Barrier to manage less significant fluvial events (see outcome 15 for further detail). A P5 policy has been assigned to manage tidal risk (to take further action to reduce risk), which reflects the requirement to raise defences in line with outcome 14 above.

The Twickenham policy unit has a relatively narrow floodplain along the Thames, although there is a large tidal/fluvial floodplain area on the River Crane and a smaller area on the River Brent. The flood risk areas are mainly residential but also contain parks and gardens including Syon House and Marble Hill Park.

It is at risk of tidal flooding from the Thames upriver of the Thames Barrier and fluvial and tidal/fluvial flooding from the Thames. It is also at risk of fluvial flooding from the River Crane, fluvial and tidal/fluvial flooding from the River Brent, and fluvial and tidal/fluvial flooding from the Duke of Northumberland's River. The River Crane has an extensive floodplain in the tidal/ fluvial interaction zone.

Richmond

Richmond also has two flood risk management policies assigned, due to the complex interaction of tidal and fluvial flood risk in this area. A P3 policy has been assigned to manage fluvial risk (in this case, to seek alternative actions), which acknowledges the need to reduce usage of the Thames Barrier to manage less significant fluvial events (see outcome 15 for further detail). A P5 policy has been assigned to manage tidal risk (to take further action to reduce risk), which reflects the requirement to raise defences in line with outcome 14 above.

The Richmond policy unit consists of a relatively narrow floodplain along the Thames, much of which floods regularly and is occupied by parks and gardens. The amount of property at risk is small but there are some historic and important sites including Ham House and part of Kew Gardens.

It is at risk of tidal flooding from the Thames upriver of the Thames Barrier and fluvial and tidal/fluvial flooding from the Thames.

63. Managing fluvial flood risk in West London

We use the Thames Barrier to manage tidal flood risk in the estuary. We also use it to reduce fluvial flooding in West London (flooding from high river flows after heavy or prolonged rainfall).

We expect that we will need to close the Thames Barrier more frequently for tidal surges as sea level continues to rise. If we continue to use the Thames Barrier to manage fluvial



flood risk in West London after 2035, we will exceed the average annual number of closures limit for the Barrier (which is 50 per year). This would cause wear and tear to the structure, limit available time for essential maintenance and have a major impact on river traffic and businesses. We therefore need to reduce using the Barrier for less significant fluvial events.

We define significant fluvial events as flows of 600 cubic metres or higher, in combination with mean high water spring tides.

We are developing models to understand the complex interaction of the tidal and non-tidal effects (e.g., river flows and rainfall) of flooding in west London. This will enable us, our partners, and communities affected to work together to develop alternative options for managing non-tidal flooding in this area.

Outcome 15: The Environment Agency will work with Hounslow and Richmond Councils to identify areas of the Twickenham and Richmond policy units that currently benefit from closing the Thames Barrier during fluvial events. In these areas, the Environment Agency will work with local communities and partners to agree and put alternative flood risk management measures in place for less significant fluvial events, improving resilience before Thames Barrier operation changes.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

64. Outer estuary flood defence raising

This outcome applies to Policy Units downstream of the Thames Barrier with a P4 policy. Please see below to find out more about each Policy Unit. After further investigation into current defence heights and projected future water levels, there may opportunities for defence raising to be delayed or merged with future interventions to provide better value for money.

Outcome 16: Flood and coastal defences will need to be raised to prepare for sea level rise. Defence owners need to work with the Environment Agency, the relevant local council and infrastructure providers to identify and capitalise on opportunities within this Policy Unit to deliver the upgrades required alongside maximising delivery of multiple benefits.



Policy Unit	Local authority
Royal Docks (downstream of the Thames Barrier)	LB Newham
Greenwich (downstream of the Thames Barrier)	LB Greenwich
Thamesmead	LB Greenwich, LB Bexley
Barking and Dagenham	LB Barking and Dagenham
Rainham Marshes	LB Havering, Thurrock UA
Dartford & Erith	LB Bexley, Dartford BC
Purfleet, Grays & Tilbury	Thurrock UA
Swanscombe & Northfleet	Dartford BC, Gravesham BC
Bowers Marshes	Basildon DC, Castle Point DC
Canvey Island	Castle Point DC
Isle of Grain	Medway Council
Leigh & Southend	Southend-on-Sea BC

Note: LB - London Borough, BC - Borough Council, UA - Unitary Authority, DC - District Council

Please select only one item

- I support this outcome
- I would support this outcome if 'X' changed
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

Royal Docks (section downstream of the Thames Barrier)

The Royal Docks policy unit includes extensive and established residential and industrial areas. It also contains the three Royal Docks, which are a focus for redevelopment and which form a raised strip of land parallel to Woolwich Reach on the River Thames. There are extensive areas of redevelopment planned in this policy unit including much of the area to the south of the Royal Docks.

A key feature of this policy unit is that it straddles the Thames Barrier so when the Barrier is closed against high tides, there is a difference of up to 2 metres either side of the Barrier. To accommodate this difference, the flood defences downstream of the Thames Barrier are up to 2 metres higher than those upstream. It is at risk of tidal flooding from the Thames upriver of the Thames Barrier and from the Thames downriver of the Thames Barrier.

Greenwich (section downstream of the Thames Barrier)

The Greenwich policy unit includes the Millennium village and other redevelopment areas on Greenwich peninsula including the O2 arena, together with North Greenwich underground



station and bus terminus. It also contains important historic buildings including part of maritime Greenwich, which is a World Heritage Site. The policy unit is a mixture of residential, urban and industrial areas. Like the Isle of Dogs on the north bank, this policy unit is the first major area of redevelopment on the south bank when travelling east from the centre of London.

A key feature of this policy unit is that it straddles the Thames Barrier so when the Barrier is closed against high tides, there is a difference of up to 2 metres either side of the Barrier. To accommodate this difference, the flood defences downstream of the Thames Barrier are up to 2 metres higher than those upstream. This policy unit is at risk of tidal flooding from the Thames upriver of the Thames Barrier, tidal flooding from the Thames downriver of the Thames Barrier and fluvial and tidal/fluvial flooding from the Ravensbourne River.

Thamesmead

The Thamesmead policy unit contains extensive development including the urban residential area of Thamesmead, the Belvedere Employment Area, and the Crossness Sewage Treatment Works. It is at risk of tidal flooding from the Thames downriver of the Thames Barrier. It is also at risk of fluvial flooding from the Marsh Dykes drainage system in Thamesmead and from the Plumstead and Erith Marshes drainage systems.

There is a serious risk of surface water flooding in this policy unit in areas where the capacity of the drainage system is low. One reason for this is that the Thamesmead policy unit is made from a large area of reclaimed land and is low lying and very flat.

Barking & Dagenham

The Barking & Dagenham policy unit contains major industrial areas, some of which are now redundant and land is available for redevelopment, and some dense residential development.

There are large areas of raised ground, and therefore a proportion of development in this policy unit is raised above flood level. It is at risk of tidal flooding from the Thames downriver of the Thames Barrier and the River Roding, and fluvial/tidal from the Beam River (West bank). It is also at risk of fluvial flooding from local watercourses, including Mayes Brook, Gores Brook and Buzzard Mouth Sewer.

Rainham Marshes

Rainham Marshes policy unit contains extensive freshwater marshes, a large landfill area, development and major transport links. The marshes are of particular importance.

It is at risk of tidal flooding from the Thames downriver of the Thames Barrier, fluvial flooding and tidal/fluvial flooding from the Beam River (East bank), the Ingrebourne River and the Mar Dyke (West bank). Also, fluvial flooding from local watercourses including Havering Sewer and the marsh drainage systems on Rainham, Aveley and Wennington marshes.

Dartford & Erith

Dartford & Erith policy unit includes extensive areas of undeveloped and developed marshes and the riverfront town of Greenhithe. It also includes parts of Dartford and Crayford.

It is at risk of tidal flooding from the Thames downriver of the Thames Barrier, tidal flooding on the Rivers Darent and Cray, and fluvial flooding from the marsh drainage systems on Crayford Marshes and Dartford and Stone Marshes.



Purfleet, Grays & Tilbury

The Purfleet, Grays & Tilbury is a large policy unit that includes Tilbury Town and parts of the urban areas of Grays and Purfleet. This policy unit has two main floodplain areas, at Tilbury and West Thurrock/ Purfleet. Much of the marsh areas are low lying, and some of the developed areas are very vulnerable to flooding. This policy unit contains numerous port facilities, such as Tilbury Port, and there are a large number of active riverside jetties and wharves.

It is at risk of tidal flooding from the Thames downriver of the Thames Barrier, fluvial and tidal/fluvial flooding from the Mar Dyke, and fluvial flooding from local watercourses in West Thurrock Marshes and in West and East Tilbury Marshes.

Swanscombe & Northfleet

Swanscombe & Northfleet includes the Swanscombe peninsula, the industrial area of Northfleet and part of the town of Gravesend. The Gravesend and Northfleet frontage includes residential, industrial and recreation areas. The industrial area extends into the Swanscombe peninsula, most of which is currently undeveloped.

It is at risk of tidal flooding from the Thames downriver of the Thames Barrier, and fluvial flooding from local watercourses including the River Ebbsfleet and the marsh drainage systems on Black Duck, Swanscombe and Botany marshes.

Bowers Marshes

Bowers Marshes policy unit is an open area of freshwater grazing marshes – an historic landscape with both upstanding historic features and buried archaeological remains. It has a major landfill site to the west, and some areas of historic landfill within the marsh areas. It is largely unpopulated but has significant infrastructure including rail, road, sewage treatment works and an electricity generation plant.

It is at risk of tidal flooding from Vange Creek (East bank) and from East Haven Creek (North Bank), and fluvial flooding from local watercourses including the Pitseahall Fleet, Benfleet Hall Sewer and the marsh drainage system on Bowers Marshes.

Canvey Island

Canvey Island consists of low-lying former marshland surrounded by high defences. The ground level is about 2m below high water on spring tides. About 60% of the island is developed, with a large residential area, caravan parks and an oil-related industrial area. The north western part of the island is undeveloped and consists of coastal grazing marsh. There is a thriving community in Canvey Island.

There are no natural streams or rivers on Canvey Island. Instead, the Island has a complex and interlinked network of surface water sewers, open and culverted ditches, ponds, and pumping stations. Rainfall runoff is collected and channelled to the pumping stations and gravity outfalls around the edge of the Island and pumped or drained out to the Thames estuary. Flooding can occur if the amount of rain falling is greater than the capacity of the entire drainage network - for example, in 2013/14 when over 250 properties were impacted by intense rainfall.

Isle of Grain



The Isle of Grain policy unit has two distinct parts: an area of freshwater marshes to the west (Allhallows and Grain Marshes) and an industrial area to the south and east. The village of Grain lies on higher ground at the north-eastern extremity of the policy unit. Much of the freshwater grazing marsh in the western part of this policy unit is a designated SPA (Special Protection Area).

It is at risk of tidal flooding from the Thames and Medway including Yantlet Creek and fluvial flooding from local watercourses including the drainage systems on the Allhallows and Grain Marshes.

Leigh Old Town & Southend-on-Sea

This policy unit overlaps with the Essex SMP (Shoreline Management Plan). Southend-on-Sea (including Westcliff-on-sea) and Leigh Old Town are distinctly different areas, and are considered separately.

Southend-on-Sea has a continuous sea frontage with beaches and very extensive (designated) intertidal areas and a pier. Whilst most of Southend-on-Sea is on high ground and not at risk from tidal flooding, much of the sea front is at risk of flooding and there is a flood defence along the entire frontage. It is likely that the Southend-on-Sea frontage will continue to be developed and improved as it is an important leisure and recreation area.

Leigh Old Town has a narrow but historic frontage bounded by the railway line to the north. It has close links to the Estuary with a strong fishing tradition. The defence level is low and properties have been built with raised thresholds and other resilience measures to protect against tidal flooding.

This policy unit is at risk of tidal flooding from the Thames and fluvial flooding from local watercourses including Prittle Brook.

65. Flood resilience in the outer estuary

This outcome will apply to all policy units in the outer estuary with a Policy 3 flood risk policy. Please see below to find out more about each Policy Unit.

Policy 3 is to continue with existing or alternative actions to manage flood risk. We will continue to maintain flood defences at their current level accepting that the likelihood and/or consequences of a flood will increase because of climate change.

Outcome 17: Flood and coastal defence owners and infrastructure providers are aware of increasing tidal flood risk with climate change and plan to realign flood defences and improve resilience accordingly. Within each policy unit listed below where there is a P3 policy to accept increasing risk with climate change, the Environment Agency will work with the relevant local council and community to ensure appropriate resilience measures are implemented.

Policy Unit	Local council
East Tilbury & Mucking Marshes	Thurrock UA
Shell Haven & Fobbing Marshes	Thurrock UA
North Kent Marshes	Gravesham BC, Medway Council
Hadleigh Marshes	Castle Point BC, Southend-on-Sea UA



Note: BC - Borough Council, UA - Unitary Authority

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

East Tilbury & Mucking Marshes

East Tilbury & Mucking Marshes consist of an area of marshes to the west of the Lower Hope reach of the Estuary. The main residential development is East Tilbury. This includes a major landfill area that provides an area of high ground. There is public access along the defences to the south of the landfill area, and it is envisaged that continuous public access will be provided in the future. There is an important area of designated intertidal habitat which runs along the frontage parallel to the defences.

It is at risk of tidal flooding from the Thames downriver of the Thames Barrier and fluvial flooding from local watercourses including Mucking Creek and the marsh drainage systems on East Tilbury Marshes.

Shell Haven & Fobbing Marshes

Shell Haven & Fobbing Marshes policy unit is divided into two distinct areas either side of the A1014 access route to the Coryton refinery. To the north are the freshwater marshes and to the south is the industrial area along the Thames frontage. The freshwater marshes are designated as part of the proposed South Essex community parklands in the Thames Gateway Parklands Vision, including restoration of Fobbing Marshes.

Sources of flooding include tidal from the Thames and Holehaven Creek, tidal from Vange Creek and fluvial from local watercourses including the marsh drainage systems on Fobbing and Vange Marshes.

North Kent Marshes

North Kent marshes consists of two extensive areas north and west of the village of Cliffe. Much of the area consists of freshwater grazing marsh and has designated freshwater habitats. There are also designated intertidal habitats along much of the Estuary frontage. At the east end of Gravesend, policy 4 is proposed. Policy 4 is to take further action to keep up with climate change and land use changes so that flood risk does not increase.

This policy unit is at risk of tidal flooding from the Thames downriver of the Thames Barrier and fluvial flooding from local watercourses including the marsh drainage systems on Shorne, Higham, Cliffe & Halstow Marshes.

Hadleigh Marshes



Hadleigh Marshes policy unit consists of an open area of freshwater marshes crossed by a railway line. The land on the higher ground to the north of Hadleigh Marshes includes Hadleigh Castle, and the overall area provides an important open rural landscape with public access along the entire Estuary frontage.

Sources of flooding include tidal from the Thames downriver of the Thames Barrier and fluvial from local watercourses including the drainage systems on Hadleigh Marshes.

66. South Essex Estuary Park growth opportunity for Essex policy units

Outcome 18: The Association of South Essex Local Authorities (Basildon, Brentwood, Castle Point, Rochford, Southend-on-Sea, Thurrock, and Essex County) will work with the Environment Agency to deliver flood risk management and multiple benefits as part of the South Essex Estuary Park growth opportunity.

This outcome will apply to:

- Purfleet, Grays & Tilbury
- East Tilbury & Mucking Marshes
- Shell Haven & Fobbing Marshes
- Bowers Marshes
- Canvey Island
- Hadleigh Marshes
- Leigh & Southend

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome

If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

67. Securing land for the future of the Thames Barrier

Outcome 19: The Environment Agency will continue to work with Thurrock, Dartford and Gravesham Councils regarding the availability and securing of land for a future barrier option in the lead up to a decision being made by 2040 on an end of century option for adapting to tidal flood risk.

Please select only one item

- I support this outcome
- I would support this outcome if 'X' was amended
- I do not support this outcome



If you selected 'I would support this outcome if X was amended' or 'I do not support this outcome', please explain your answer.

68. What further information, outcomes or guidance would you like to see for the area of the Thames Estuary you are interested in, or have responsibilities in?

This can be at Policy Unit level or more specific. Please also comment on the suggested outcomes above where appropriate.

Structure of the updated Plan

We want to make sure that the updated Thames Estuary 2100 Plan includes the most relevant information for everyone who uses it and is easy to access and understand. We plan to publish the updated Plan in the first half of next year. This provides an opportunity to shift from a large PDF document to a webpage on Gov.uk.

In 2021, we ran a series of research interviews with users of the Plan. In these interviews, we asked about how they access the Plan and what we could change to make it easier to find information. Almost all users wanted an online Plan with a contents list, with links to relevant data and information, and an interactive map showing what different stakeholders need to do to manage tidal flood risk in each area.

We propose including the below list of topics in the updated Plan, and would like to understand whether you agree with these topics, or if you feel something important to you is missing from the list.

69. Do you agree with the proposed list of section headings for the updated Plan?

How to use the Plan

- Navigating through the Plan
- How to view outcomes for your area (interactive map)
- How to use the data portal
- Contact us

Background

- Introduction to the Plan



- Why we need a tidal flood risk management plan for the Thames Estuary
- How we developed the Plan
- An adaptive approach – planning for a range of climate futures
- Phases of the Plan to 2100
- Responsibilities for delivering the Plan

10 years in – an updated Plan

- Progress on delivering the Plan to date (case studies)
- Key findings from the 10-Year Review
- Using a benefits-led approach to managing flood risk
- Working together to create an investment strategy
- Further work beyond the 10-Year Review

Thames Estuary 2100 Plan objectives

- Aims, objectives and benefits of the Plan

Delivering the flood risk management policies:

- Sources of flooding in the Thames Estuary
- Flood risk management policies and Policy Units
- How we manage and maintain flood defences (asset management)
- TEAM2100 and the Next Delivery Vehicle
- Flood risk management deadlines and how they are determined

Delivering multiple benefits:

- Placemaking and the riverside strategy approach
- Developing a land strategy

Tackling the climate emergency:

- Sustainability ambitions
- Habitat

Outcomes

- Estuary-wide outcomes
- Policy Unit outcomes (i.e., each local area)

Please select only one item

- Yes
- No
- I don't know

If you do not agree, please explain what needs to be added or amended.



70. How useful are these features when using the updated Plan?

Updating the Thames Estuary 2100 Plan and moving to an online Plan creates an opportunity to develop new features which improve how to find and access the information within it. With each update of the Plan, we aim to include more information and available data and increase its features and functionality.

Note: Downloadable datasets could include relevant data and information. For example, current flood defence heights, conditions of flood defences and modelled sea-level rise data.

	Short video intro	Links to relevant plans and strategies	Downloadable slide packs on key principles	Interactive map showing outcomes by location	Interactive map postcode search	Downloadable GIS datasets and map layers	Clear signpost to supporting information	A glossary of terminology	Email alerts for updated content
Not useful at all									
Somewhat useful									
Neutral									
Somewhat useful									
Very useful									

Please add any comments or suggestions for additional features here.