



# Executive Summary

Meridian Water has an ambition to be an exemplar sustainable development. The Environmental Sustainability Strategy sets out a vision and framework for achieving that ambition. The vision is founded on three core goals to address the three most significant global environmental challenges: climate change, mass extinction of species and resource depletion.

## Carbon Positive

To meet Enfield's climate commitments Meridian Water will be carbon neutral by 2030, and strive for carbon positive over the whole life of the development. This means Meridian Water will minimise its embodied carbon in construction, use sustainably sourced materials, use only zero carbon power through a combination of on-site generation and renewable power purchase agreements, foster active travel and support high-quality, healthy and low carbon lifestyles.

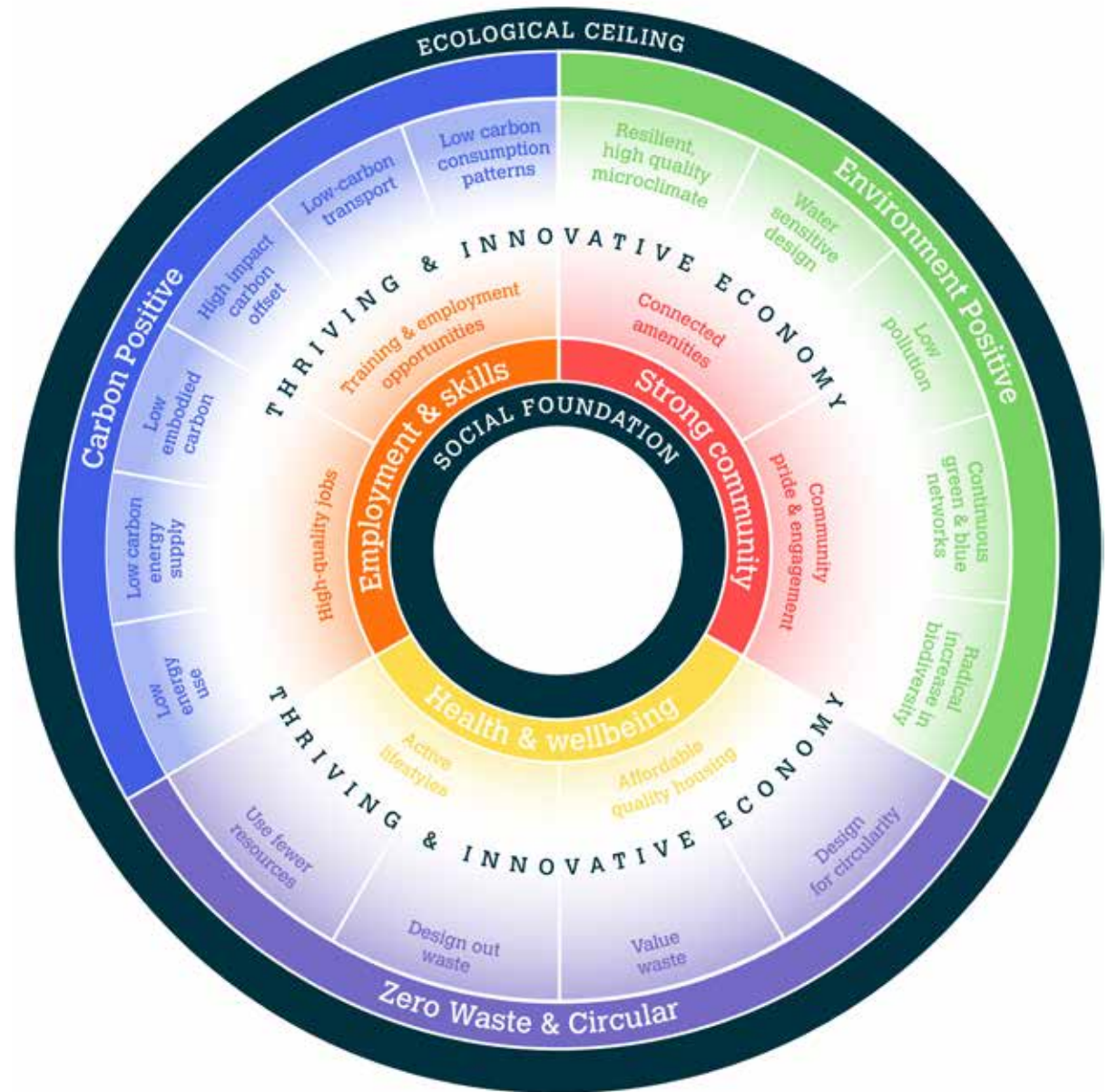
## Environment Positive

The natural environment will be restored to promote a radical increase in biodiversity. Continuous green and blue networks will link Meridian Water with the wider Lee Valley Regional Park. The public realm, buildings and streets will be designed to create a safe and welcoming environment and comfortable micro-climate, that is resilient to climate change and supports active and healthy lifestyles.

## Zero Waste and Circular

Waste will be eliminated through adoption of circular design principles, sharing networks and eco-innovation. Meridian Water will be a regenerative built environment where whole buildings, materials and components will be retained at their highest value for as long as possible.

The framework follows an approach based on Kate Raworth's 'Doughnut Economics', which proposes that true prosperity is only achieved when certain fundamental social needs are met, without exceeding the ceiling of ecological limits. The 'thriving and innovative economy' is the area within which inclusive and sustainable development takes place; here, the economy is seen as way of redistributing social and environmental value, rather than a goal in itself.



# Executive Summary

## Carbon Positive

Meridian Water will be carbon neutral by 2030 and become carbon positive over the life of the project. In the first 5 years it will exceed the New London Plan targets for operational carbon emissions. Over the life of the development it will minimise carbon emissions and increase the amount of zero carbon energy generated. The carbon positive strategy will focus on 3 key steps:

1. Minimise carbon emissions from embodied carbon and from regulated and unregulated uses.
2. Require developers to generate as much zero carbon energy on site as possible both for buildings and transport use.
3. Invest through the carbon offset scheme in Borough wide certified carbon reduction projects and to purchase power from new off-site renewable generation sources.



## Environment Positive

Meridian Water will maximise the quantity and quality of green and blue space provision as part of its commitment to radically increasing biodiversity and the supporting wellbeing. Enhancements will be delivered incrementally over the life of the project starting with major greenspace and public realm projects that will be delivered through the Strategic Infrastructure Works. The environment positive strategy will focus on 3 key areas:

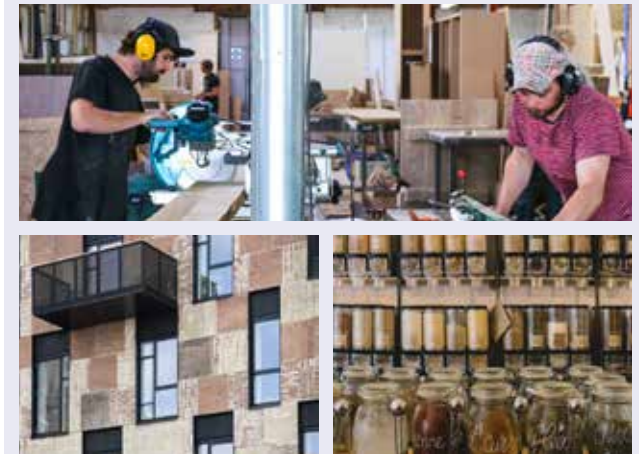
1. Integrate green and blue space into the masterplan and within each neighbourhood in a way that maximises the benefit for nature and amenity and to ensure that this is delivered incrementally and managed to the highest standards over the life of the project.
2. Ensure that all green and blue spaces are multi-functional and of the highest quality.
3. All homes will meet good health and well-building standards including for daylight, sunlight, overheating, overlooking, views of the sky and air and noise quality.



## Zero Waste & Circular

Meridian Water will minimise resource use by focusing on lightweight design, using sustainably certified, secondary and healthy materials, and by minimising waste. An engagement and innovation programme will be developed to support use of new low carbon and recycled materials and to push the boundaries on long life, loose fit, energy efficient development and use of modern methods of construction. The zero waste and circular strategy will focus on 3 areas:

1. Design and construction to ensure that zero waste goes to landfill whilst also using high levels of recycled materials.
2. Design the development so that it will flourish overtime, is adaptable and can be disassembled and materials reused at the end of their useful life.
3. Design and operate the development in ways that minimise waste, allow waste to be reused or recycled and support new circular and sharing models including maker spaces, hub offices, sharing of mobility, facilities and 'things' etc.



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## **Introduction**

This section summaries the scope, purpose and structure of this report and introduces the sustainable development process.



# Scope and purpose of this report

Useful Projects have been commissioned by Meridian Water to develop the Environmental Sustainability Strategy for the Meridian Water development.

Sustainable development should adopt a triple bottom line approach that integrates environmental, social and economic sustainability.

The Environmental Sustainability Strategy sets an ambitious vision, with clear objectives and measurable requirements over the short, medium and long term. The strategy is intended to provide a holistic approach to environmental sustainability and sets performance requirements that allow developers and their consultants to determine how best to meet the goals and objectives.

This is the first version of the 'site-wide' strategy that is applicable to the entire Meridian Water development. It has been developed in consultation with the Meridian Water team, the London Borough of Enfield, the consultant team, contractors and external stakeholders prior to submission to the Cabinet for formal adoption.

The strategy will be continually reviewed and renewed in response to changes in national, London and Local policy, innovation in clean technologies and construction practice, as well as scientific evidence about the impact of climate change.

The Environmental Sustainability Strategy sits alongside and should be read in conjunction with the Implementation Action Plan and Implementation Programme. The Action Plan sets out what is needed to deliver the strategy including integrating the environmental strategy with the economic and social strategies, developing theme specific strategies, and establishing an implementation strategy for embedding environmental sustainability throughout the development including in the design, procurement,

construction and operation of all elements of the project. The Implementation Programme shows the interplay between individual projects, the Environmental strategy implementation and the evolution of the Economic strategy and Social strategy. This sets out the target strategy and the mechanism of how the three strategies work together for all of the projects.

The Strategy is intended to be adopted by all aspects of the project including masterplanning, infrastructure and utility works, design codes and development proposals, landscape and meanwhile uses.

Once the strategy is adopted and integrated into all the different elements of the project, the Meridian Water team will ensure it is implemented through all phases of the development from design, procurement and construction to post construction management, maintenance and as assets come to the end of their life, to their disassembly and replacement.



Triple bottom line approach to sustainable development

# Report structure

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The Environmental Sustainability Strategy comprises the following sections:

## **Environmental Vision**

This section summaries the development and sustainability context for Meridian Water, including locating it within the regulatory and policy framework that is underpinned by the Climate Emergency. It then sets out the environmental sustainability vision and framework for Meridian Water.

## **Environmental Objectives and Requirements**

The following section sets out the specific sustainability objectives and requirements against each of the three key goals: Carbon Positive, Environment Positive and Zero Waste and Circular.

## **Social Value and co-benefits**

This section sets out how adopting the Environmental Sustainability Strategy and integrating it with the with the social and financial strategies can deliver co-benefits and value for Meridian Water.

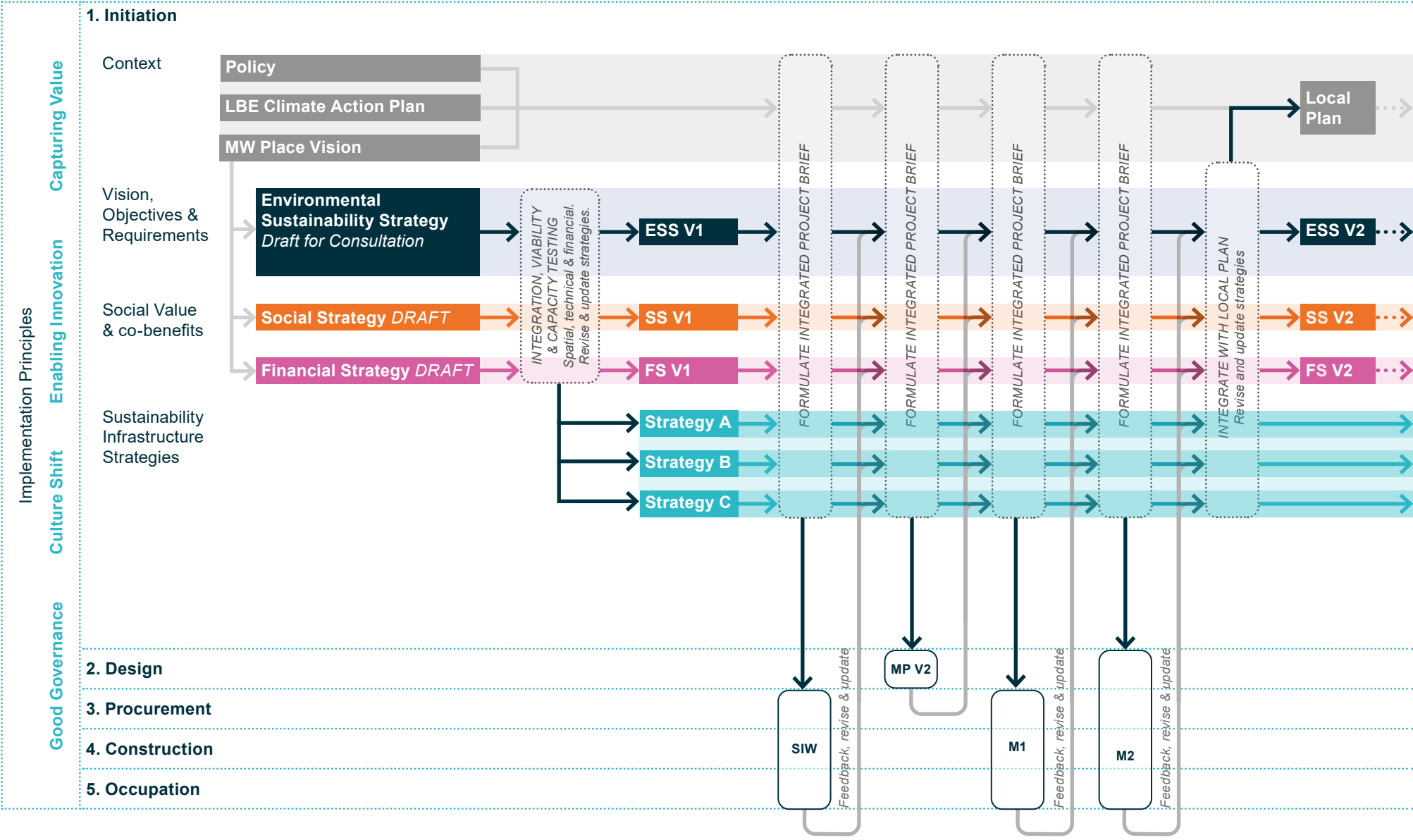
## **Implementing the vision**

The implementation section provides a high level overview of how the Environmental Sustainability Strategy should be embedded in all aspects of the development, design and delivery process, based on four implementation principles.

## **Sustainable development precedents**

A selection of best practice case studies for sustainable development, with a focus on London precedents alongside relevant international and UK examples. Innovation and social value precedents are also included. This section draws out applicable approaches for Meridian Water.

# Sustainable development process





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## **Environmental Vision**

This section summaries the development and sustainability context for Meridian Water, including locating it within the regulatory and policy framework that is underpinned by the Climate Emergency. It then sets out the environmental sustainability vision for Meridian Water.



# Sustainable development context

## Climate Emergency

There is a global climate, biodiversity and resource emergency. Nations across the world have declared a Climate Emergency, including the UK Government who were the first to make a legally binding commitment to net zero emissions by 2050.

In July 2019 Enfield Council signed a climate emergency pledge and their Climate Action Plan was adopted in July 2020 which commits to the Council being a carbon neutral organisation by 2030 and the Borough being carbon neutral by 2040. The Action Plan sets out how this will be achieved.

## Enfield Climate Action Plan

The Climate Action Plan covers 8 areas: Council operations, travel, buildings, waste, energy, natural landscape, influencing others and financing the action. 6 of the areas include approaches and actions that will influence the Meridian Water development.

## Council Operations

This area sets out the Council's approach to offsetting, which focuses on three solutions: natural offsetting through green infrastructure, solar installation, wind technology. Local offsetting within the Borough should be prioritised. Meridian Water should follow this offsetting approach.



Enfield Climate Action Plan, adopted July 2020

## Travel

Includes actions to support modal shift to active, efficient and sustainable transport modes, delivery and access to the borough's strategic cycling network and the provision of EV charging points. These actions and associated KPIs must be embedded in Meridian Water.

## Buildings

The plan requires all buildings to be carbon neutral by 2040 and resilient to climate change. All new residential development should follow passive principles and all non-residential buildings should achieve BREEAM 'Outstanding' or equivalent. Targets for reducing embodied carbon in buildings will be set in 2021.

## Waste

To achieve increased recycling rates and less waste Enfield are reviewing how waste is managed and collected at building scale. Meridian Water should consider innovative waste management solutions to support this. The Council are also supporting the NLWA low plastic zones initiative; Meridian Water should be a low plastic zone.

## Energy

The Plan sets out a diversification approach to energy inline with the Committee on Climate Change (CCC) recommendations. The Council will prioritise actions as follows: fabric first and insulation, second, switch to renewables with a target of increasing renewable energy by 2% per annum for 10-years, third, heat pumps to provide heat and summer cooling, fourth, decentralised energy and fifth, hydrogen. The energy strategy for Meridian Water should align with the Council's approach.

## Natural Landscape

Increased provision of tree planting and green/blue infrastructure are key actions. Meridian Water should make a significant contribution to the Borough's tree planting, establishment of new areas of woodland and wetlands as part of integrated flood resilience and water strategies.

## Covid-19 and the Green Recovery

The Covid pandemic has had an unprecedented economic impact and exposed issues around poverty and inequality, with ethnic minorities and people living in disadvantaged areas disproportionately affected by the virus and the impact of lockdown.

But the enforced lockdown have had positive impacts on the environment and reducing carbon emissions. The UK recorded a 31% decline in emissions in April 2020, compared with 2019. With more people working from home and the subsequent reduction in travel, London benefited from huge reductions in air pollution, with the busiest roads recording on average half the levels of nitrogen dioxide to those pre-lockdown. Wildlife has been thriving, especially in urban areas with a notable increase in sightings.

As we begin to recover from the pandemic there is a great opportunity to rebuild the economy and society in a way that accelerates climate action and the road to zero carbon, creates more equal communities and improves wellbeing for all. In July the government committed to "build back better and build back greener".

The vital importance of green infrastructure has never been more pertinent and protecting nature is at the heart of the UK's green recovery. The government has established the Green Recovery Challenge Fund to create jobs in nature recovery and conservation. The vast inequalities in the provision of and access to green space must also be addressed, with more green spaces needed in deprived areas to support improved health and wellbeing.

There is the chance to transform the economy through investment in green industries, including renewable energy, electric mobility and retro-fitting existing buildings. Such investment is essential for achieving the UK's climate commitments, but will also create training and job opportunities, tackle fuel poverty and improve health and wellbeing.



# Vision for a Sustainable Meridian Water

Meridian Water is a flagship development for Enfield. Over the next decade this new sustainable urban neighbourhood will make a significant contribution to Enfield's transition to carbon neutrality, in line with the Council's Climate Action Plan.

## Carbon Positive

To become net zero by 2030 Meridian Water will use zero carbon construction, be powered by renewable and sustainable resources, minimise its use of energy through a combination of passive, technological and smart measures, generate as much energy as possible locally and procure any remaining energy from new exclusively procured renewable sources. Meridian Water will foster sustainable travel, and support high quality, healthy and low-carbon lifestyles. A series of well-planned infrastructure interventions will enable and encourage active travel, with adoption of mobility on demand resulting in extremely low private car usage.

## Environment Positive

In the face of catastrophic biodiversity loss, Meridian Water will actively restore the natural environment, to promote a radical increase in biodiversity. Continuous green and blue

networks will link Meridian Water with the wider Lee Valley Regional Park, creating a clean and healthy environment and providing parklife on the doorstep for local residents and visitors. 30% of the site area will be set aside as public green space, including parks and squares, active and healthy green streets, and smaller open spaces.

The built environment will create a resilient, high-quality microclimate. Lively and animated streets will form part of a well-connected and active public realm, where good quality local amenities and a thriving local economy will make Meridian Water a highly desirable neighbourhood. Quality jobs, great schools, access to world class healthcare and a strong local arts and culture scene support a resilient and empowered community.

## Zero Waste and Circular

Over its whole life cycle, Meridian Water will act as a catalyst for the development of local zero carbon supply chain that is based on the principles of a circular economy. Waste will be eliminated through adoption of circular design approaches, sharing networks and eco-innovation. Meridian Water will be a regenerative built environment where whole buildings, materials and components will

be retained at their highest value for as long as possible. The development will prioritise local, low carbon and circular (recycled / regenerative / reused / refurbished) manufacturing and construction.

All of this will make Meridian Water the Greenest Development in London.

On the next page we set out a framework for a sustainable Meridian Water, that will support the delivery of this vision.



Images from Meridian Water Place Vision

# Sustainability Framework and Goals

Delivering the vision will require a systematic approach and solutions that achieve multiple sustainable outcomes. We have framed the sustainability objectives around the following six core goals:

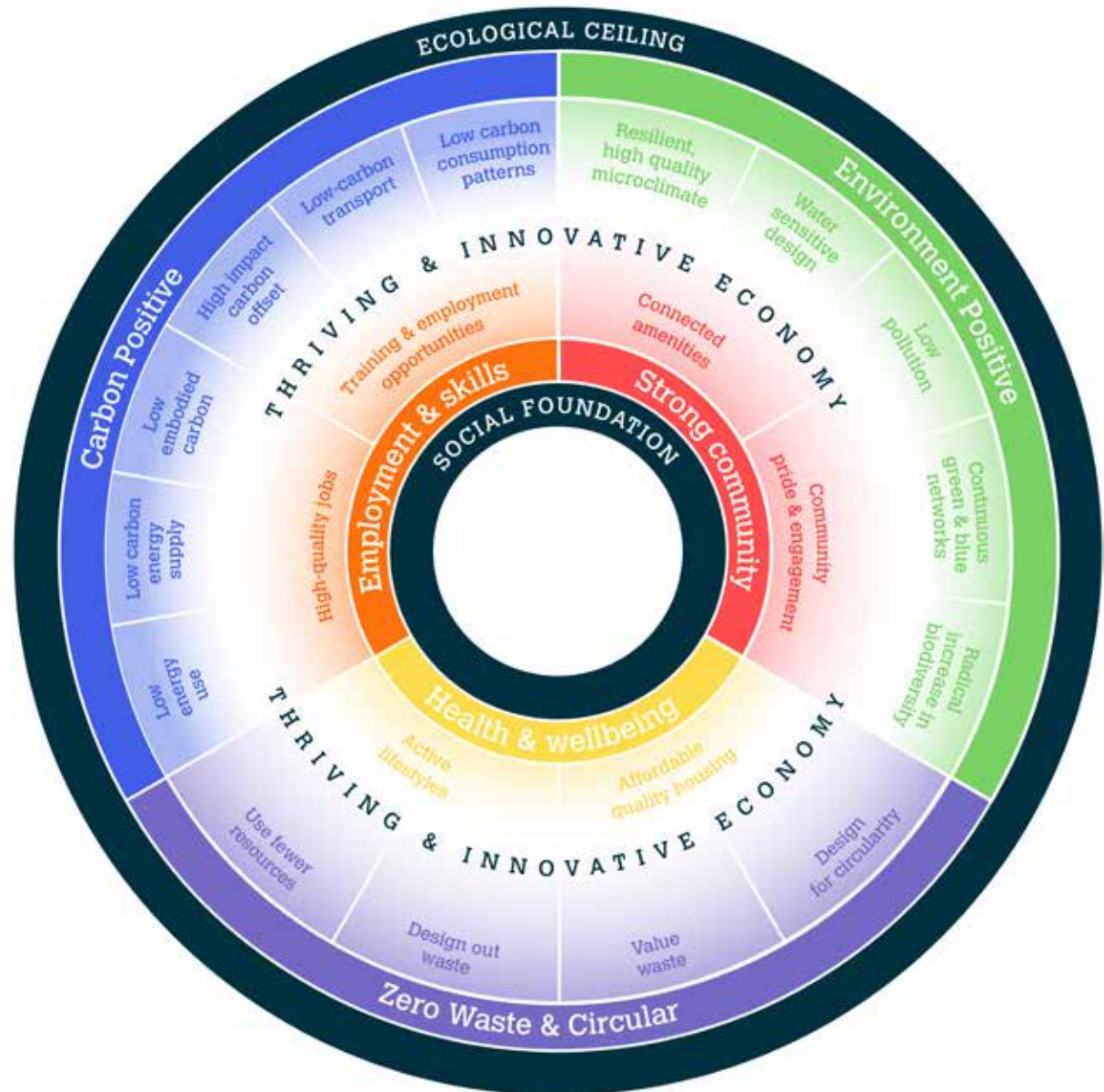
- Carbon Positive
- Environment Positive
- Zero Waste and Circular
- Employment and Skills
- Strong Community
- Health and Wellbeing

The environmental goals respond to the three most significant global environmental challenges: climate change, mass extinction of species and resource depletion.

The social goals are guided by the understanding that Meridian Water sits in an area of high social deprivation and will contribute to raising socio-economic and health outcomes of local people. Meridian Water will be designed to create meaningful employment, high-quality education opportunities and support healthy and empowered citizens.

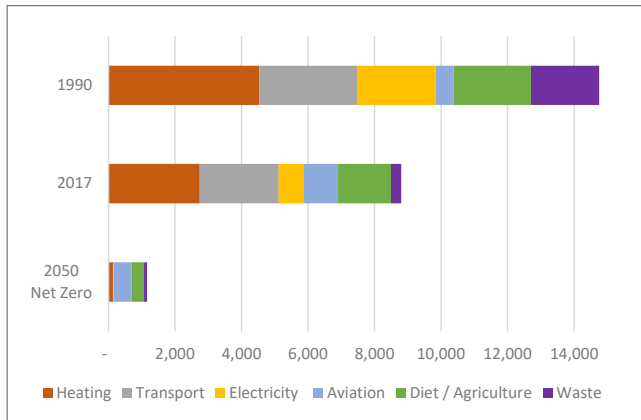
This approach is based on Kate Raworth's conceptualization of 'Doughnut Economics', which proposes that true prosperity is only achieved when certain fundamental social needs are met, without exceeding the ceiling of ecological limits. The 'thriving and innovative economy' is the area within which inclusive and sustainable development takes place; here, the economy is seen as way to create social and economic value in a way that also preserves and regenerates the environment.

Together, these goals provide a framework against which objectives and requirements can be set and progress monitored and reported. The next sections outline a series of principles and approaches through which the key goals can be met. We then present a series of detailed objectives and requirements for the environmental themes, which are the focus of this strategy.



# Carbon Positive Principles

For Meridian Water to deliver an exemplar and carbon positive development, emissions associated with buildings, transport, goods and services will need to be reduced to net zero. This is a significant change from the present situation, where the building and transport sectors are significant contributors to carbon emissions both globally and locally (see figure below).



UK Average household emissions and transition to zero carbon  
[Source: Committee Climate Change and Catapult Energy Systems]

## Buildings

With the construction and operation of buildings currently accounting for 39% of energy-related global carbon dioxide emissions, the role of buildings in a zero emissions future is significant. In the context of growth, it is recognised that new development, like Meridian Water, will need to contribute more to a net reduction in carbon emissions, and sooner, to support the 2050 target, with all new buildings being net zero carbon by 2030.

At Meridian Water the zero carbon scope will encompass total in-use performance and whole life embodied carbon impacts.

To deliver zero carbon buildings Meridian Water will adopt approaches to achieve **low energy use** including reducing energy demand through passive and ‘fabric first’ design, and providing highly efficient building systems, with smart controls, metering and management.

Energy demand will be met through a **low carbon energy supply** that uses low carbon heating (and cooling), from the Meridian Water Heat Network. The remaining demand should be met through renewable sources, prioritising on-site renewable energy, such as photovoltaics and solar thermal.

Through innovation in timber construction, low-carbon materials, (including concrete and steel), lean and circular design approaches and modern methods of construction all buildings will have **low embodied carbon**. Compared to traditional construction methods all buildings will seek to reduce embodied carbon by 50-70%.

Any remaining emissions can be mitigated using **high impact carbon offset** to achieve a net zero carbon balance.

## Defining Zero Carbon Buildings

At Meridian Water the zero carbon scope will encompass total in-use performance (including unregulated operational energy) and whole life embodied carbon impacts, as defined by the UKGBC net zero carbon buildings framework.

### Net Zero Carbon - Construction

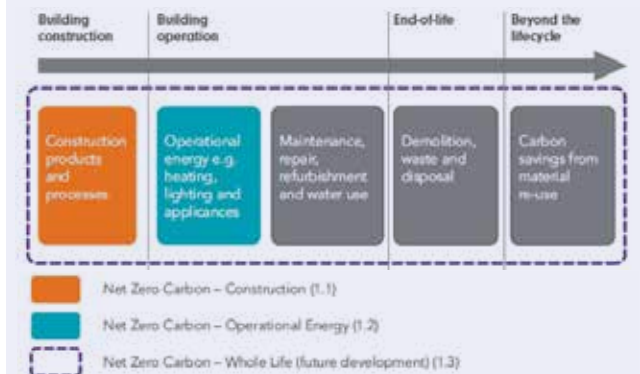
“When the amount of carbon emissions associated with a building’s production and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of on-site renewable energy.”

### Net Zero Carbon – Operational Energy

“When the amount of carbon emissions associated with the building’s operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable energy sources, with any remaining carbon balance offset.”

### Net Zero Carbon – Whole Life

“When the amount of carbon emissions associated with a building’s embodied and operational impacts over the life of the building, including its disposal, are zero or negative.”



Breakdown of three net zero carbon scopes  
[ref: Net Zero Carbon Buildings, A Framework Definition, UKGBC, April 2019]



# Carbon Positive Principles

## Transport

The transport sector is responsible for significant carbon emissions, both globally and locally. To meet emission reduction commitments, a significant modal shift is required away from private vehicle ownership and use towards shared and on-demand mobility, with increased use of active modes of travel. The Mayor of London has set ambitious active travel goals, aiming for 80% of all trips in London to be undertaken by walking, cycling, or public transport by 2041.

Private car ownership in Enfield is high. Our current dependency on private cars comes at a high cost: cars are only used 4% of the time but take an staggering 50km<sup>2</sup> of high value land for parking, and 13,600km of road space whilst over 20% of the total area of London is given over to highways and roads for vehicles.

The existing Meridian Water development site is located in travel zone 4. The opening of the new Meridian Water station in 2019 has improved rail access, but the site still has a poor PTAL rating and limited access to public transport and walking and cycling routes. A radical improvement in connectivity based on **low carbon transport** is required to support the development of 10,000 homes and achieve the Mayor's goals for modal shift and active travel. Meridian Water must deliver an integrated, active and sustainable approach to transport based on very low levels of private car ownership.

Priority should be given to providing a safe and accessible active travel network, including the realisation of plans to extend the existing strategic cycle network and improvements to the north-south cycling routes along Lee Valley Regional park. Meridian Water should follow Cycleways and Healthy Streets approaches that have transformed London's streets and enabled the number of cyclists to almost double in the last 10 years. [ref: Mayor's Transport Strategy, 2018].

By creating convenient access to high-quality and affordable local amenities and excellent job opportunities, Meridian Water will reduce the need to travel greater distances to fulfil day-to-day needs.

Longer journeys should prioritise public transport and the development must improve rail and bus access. The area may benefit from Crossrail 2 in the 2030's. Any remaining vehicle trips must be part of the UK-wide transition to EV. Meridian Water should be at the forefront of emerging trends and technologies, such as peer-to-peer rental car schemes, shared vehicle platforms and offering mobility-as-a-service. London is a leader in congestion and emission based charging, which should be extended to the development.

The move away from private vehicle usage will provide additional socio-economic benefits: active travel supports health and wellbeing, and the freeing up of space typically reserved for parking will allow more space to be reclaimed for other uses.



Meridian Water existing PTAL map

1a (worst) 1b 2

## Consumption

As global demand for resources grows, there is an urgent need to decouple economic growth from the consumption of material goods. Households at Meridian Water will have a significant role to play in meeting the 2050 emissions reduction target, by adopting **low carbon consumption patterns** as part of more sustainable lifestyles.

At Meridian Water, low carbon, mindful consumerism needs to be embedded in the physical and societal structures, to enable carbon positive lifestyles. This must include changes to our food habits, waste generation, reuse and disposal and consumption of goods.

We are seeing a shift away from private ownership and conspicuous consumption, toward a 'sharing economy' and 'experience economy'. Meridian Water has both an opportunity, and a responsibility to support households and their occupants' transition to a net zero emissions society, well before 2050. This can be facilitated through the adoption of circular economy principles.

Additional planning may need to take place for supporting this transition in the context of social distancing and increased hygiene concerns necessitated in response to the Covid-19 pandemic.

# Carbon Positive Precedents



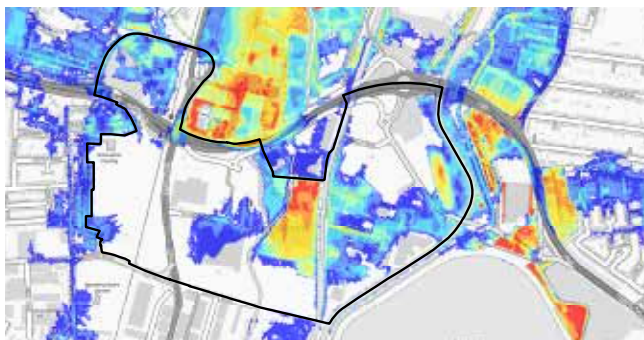


# Environment Positive Principles

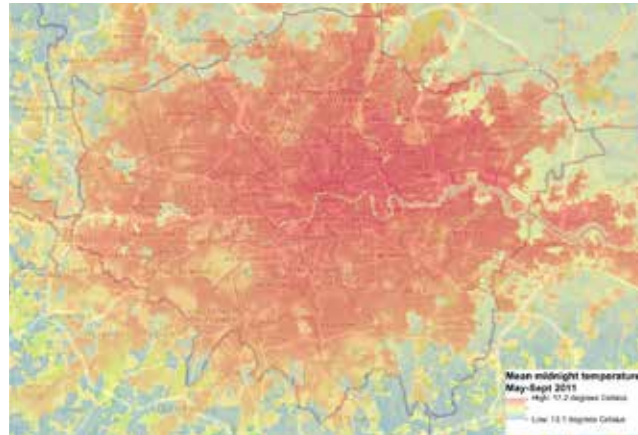
## Climate Change Adaptation

Situated within the Lee Valley river basin Meridian Water is currently at significant flood risk, including river and surface water flooding. This will increase further owing to climate change. The site is also characterised by large impermeable areas. Development has the opportunity utilise and celebrate the existing waterways by incorporating elements of **water sensitive design**, to reduce flood risk to the site and surrounding catchment area. This can be achieved by including SUDS and flood protection, particularly to river park areas, and integrating the sustainable drainage and flood control strategies with enhancement of waterways, landscape and biodiversity - to maximise the value and co-benefits of each intervention.

The heating effects of climate change are exacerbated in cities and urban areas. This 'urban heat island' effect (UHI) means that summer temperatures at midnight in London are approximately 4°C higher in the city centre than surrounding rural areas. Meridian Water is seeking to increase density while providing a sustainable urban environment. As such, development will need to allow for a **resilient and high quality microclimate** as well as healthy and comfortable indoor environments, through adopting appropriate design approaches that mitigate the urban heat island effect. These include the effective use



Meridian Water site 1 in 100 year + 35% climate change flood risk map



Urban Heat Island effect in London

of microclimate, daylight/sunlight and urban heat island modelling from early stage design to inform urban layout, street widths, building massing, orientation and planting strategy. The design of the urban layout can also improve air quality by allowing for effective flushing of pollutants.

In addition, it is beneficial to use microclimate analysis and design to maximise outdoor living (private and public), especially reviewing exposure to sunlight and wind, and optimising design trade-offs between access to daylight and sunlight, views, privacy, thermal comfort and building energy use.

## Green and Blue Infrastructure

As London grows and density increases more green and blue space is required to redress the loss of biodiversity and contribute to healthy communities. Half of London is considered to have poor access to public green spaces, and Edmonton is among the wards with the greatest deficiency in Public Open Space. Furthermore the quality of some parks has declined in recent years, because

of cuts to funding. As Enfield's population expands, it is seeking to maintain and improve access to open space and play. Investment in blue and green infrastructure will contribute towards cleaner air and **low pollution**. Sources of pollutants should be minimised, where possible, to allow habitats to thrive and provide healthy spaces for people to enjoy.

Whilst the existing site is largely brownfield it sits in the Lee Valley region, which is characterised by waterways, marshlands, wild nature and recreation opportunities. There is great potential to extend the green and blue corridor, by providing **continuous blue and green networks** that reconnect the Lee Valley and extend its unique character into the site. Restoring green spaces will further increase resilience to both flood risk and the urban heat island.

A key objective of Meridian Water is to enable a **radical increase in biodiversity**. The last century has seen unprecedented decline in the UK's biodiversity. The Wildlife Trust estimate a 41% decline in species in the last 50 years. To redress this loss, the development will need to take bold approaches, such as creating new blue/green corridors to link adaptation strategies to habitat enhancement and incorporating extensive areas of green roofs and other high quality green spaces into development. The use of methodologies such as Green Space Factor and Biodiversity Net Gain will be essential to assess the baseline, set appropriate targets and measure progress.



# Environment Postive Precedents



# Zero Waste and Circular Principles

The Circular Economy is a model for retaining resources in use and at their highest value. The London Waste and Recycling Board estimates that the transition to a Circular Economy could contribute between £3 billion and £5 billion in growth for London by 2036 and create as many as 12,000 jobs. Developing and implementing a circular strategy in Meridian Water can support broader ambitions including job creation and economic development.

By following the approaches set out below, the circular economy becomes an effective foundation for development, market disruptor and creator of local benefits.

## Building Design and Construction

In the UK, the construction sector is the biggest consumer of materials and producer of waste. Up to 50% or 280 million tonnes of all material use and over 60% or 140 million tonnes of all waste generated result from construction related activities, contributing approximately 40% or 230 Mt CO<sub>2</sub>e of the UK's total carbon emissions. Abundantly used steel and concrete contribute 25% and 19% alone.

Enfield and the Meridian Water project are particularly well placed to consider how to transition to a circular approach to development. As the landowner and primary developer, it can set new standards and approaches that promote **design for circularity** and lead the way in producing a circular economy strategy to underpin all phases of the project and ensure. Enfield must engage with the future community to highlight the local benefits and business opportunities that can come from a circular economy approach.

In the context of a resource-intensive built environment sector, Enfield must work with its delivery partners to **use fewer resources**. To do this they will need to 'build more with less' and seek alternatives to waste from construction, operation and decommissioning going to landfill or incineration, over the whole lifecycle of assets.

Numerous approaches can be taken to **design out waste**, wherever possible. At a strategic level, these include ensuring that the investment in materials and buildings delivers maximum benefit, high utilisation of spaces throughout the day, through colocation of services and spaces that can be used in different ways. Buildings should be designed for their whole life cycle, so they are adaptable to changing needs. This means design for low maintenance, adaptability and disassembly. In particular, housing should provide for all stages of life to foster diverse and resilient communities.

Design should consider future reuse, based on the concept of Buildings as Materials Banks (BAMB) and specify biomaterials and low carbon construction materials such as timber or reused materials, where feasible.

In addition, the masterplan should provide opportunities for environmental and sharing economy businesses to thrive, by allocating space to organisations and start ups that support circular business models.

Steps will also need to be taken to reduce resources during construction. These include undertaking a resource audit to identify local suppliers, natural resources and local expertise,



Visualisation of planned visitor and education centre, part of the North London Heat and Power Project (NLHPP)

and the use of secondary, recycled and reused materials to reduce consumption of virgin materials.

There may also be an opportunity to establish a local offsite construction facility and skills academy. This could enable the manufacture of prefabricated components for modular construction (MMC). Modular construction can reduce material waste, reduce programme lengths and provide highly skilled local employment opportunities.

## Operational Waste

Enfield is part of the North London Waste Authority. Initiatives are already being put in place to turn some of the waste generated in North London into lower carbon heat for use in development. Enfield should work with the NLWA on approaches that **value waste** - that is, ensure that material use and waste recycling achieves the highest economic, social and environmental value possible.

To achieve this, they will need to build a local supply for the provision of circular economy technologies, solutions and services, and stimulate the sharing economy to reduce the ownership of products from cars to power tools - recognising the link to accessibility and affordability.

Specific approaches to reducing and managing operational waste include using consolidated and reverse logistics to optimise deliveries and waste collection, and working directly with NLWA to provide integrated services to enable greater material recovery.



# Zero Waste and Circular Precedents





# Policy Context

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As well as meeting and exceeding the local planning policy requirements, the vision and strategy for Meridian Water is aligned with national and international climate change and sustainable development policy. High level, strategic policy is highlighted below, while more detailed guidance around specific themes, objectives and requirements is summarised in the next chapter.

## International

### **Paris Agreement and the Nationally Determined Contributions (2016)**

The Paris Agreement sets out a global framework to limit global temperature rise below 2°C, with a target of 1.5°C in accordance with the recommendations of the IPCC. Signed by 175 countries, including the UK, it is the first legally binding global climate change agreement and came into force in November 2016. All parties have agreed to reduce emissions and the majority have submitted National Climate Action Plans (NDCs). Countries must review their contributions and update their NDCs every 5 years.

### **Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report AR5 (2018)**

Since the Paris Agreement the IPCC have called for increased action to achieve net zero carbon by 2030, including placing a higher price on emissions, shifting investment patterns, accelerating the transition to renewable energy and enabling demand-side mitigation and behavioural change.

### **United Nations Sustainable Development Goals (2015)**

The UN set 17 goals for sustainable development that were adopted by UN Member states in 2015. The goals are interdependent and recognize that development must balance environmental, social and economic sustainability. The SDGs are intended to be achieved by 2030.

## National

### **Climate Change Act, HM Government (2008)**

In 2008, the UK pledged to reduce greenhouse gas emissions by 80% against 1990 levels, by 2050. To

achieve this they set carbon budgets and established the Committee on Climate Change. In 2019, the UK became the first nation to make net zero by 2050 a legally binding commitment.

### **National Planning Policy Framework (NPPF) 2018**

The National Planning Policy Framework sets out the Government's planning policies for England, to ensure sustainable development is delivered at a national level. The document defines the overarching objective of sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs. It covers social, environmental and economic needs.

### **Planning for the Future, 2020**

In August 2020 the government launched public consultations on three reports to fundamentally change the planning system in England.

In addition, the government also recently held a consultation on its Future Homes Standard that sets out a pathway to zero carbon homes by 2025.

These documents together set out proposals for very significant changes to the whole planning system which will be far more centralised with less discretion for Local Authorities to develop local development management policies.

The new planning system will essentially pre-designate areas as growth, renewal or protected zones. Meridian Water will in all likelihood be designated a growth area in which development will have outline Permission in Principle provided by adoption of the Local Plan. A masterplan and design guides will set out any specific local requirements but these will have to comply with national standards and guidance.

This may have an impact on the extent to which the environmental policies and standards set out in this strategy

can be applied to land within Meridian Water that is not directly owned by the Local Authority. The policies currently lack detail so it is not possible to predict what the actual impact will be at this stage.

## Regional and local

### **New Draft London Plan (NDLP), July 2019**

The London Plan is the statutory Spatial Development Strategy for Greater London prepared by the Mayor of London. The current 2016 Plan is still the adopted Development Plan, but the NDLP is significant material consideration in planning decisions. The emphasis of the NDLP is accommodating growth in a way which is environmentally, economically and socially sustainable.

### **The Enfield Plan Core Strategy 2010-2025**

The Core Strategy sets out a spatial planning framework for the long term development of the Borough for the next 15 to 20 years. It contains core policies for delivering the spatial vision that cover environmental protection, physical and green infrastructure, housing and community services and economic development and enterprise.

### **A New Local Plan for Enfield 2018-2036 (2018)**

Currently in draft form, the council are aiming to consult on the next version of the Local Plan in late 2020.

### **Edmonton Leaside Area Action Plan (ELAAP)**

The ELAAP sets out the vision, objective and specific area policies for the Edmonton Leaside Area, including Meridian Water. Key objectives include building a sustainable urban neighbourhood and delivering sustainable regeneration, within the context of facilitating economic growth.

# Policy Context

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## Implications for Meridian Water

While the policies reviewed above already set high standards for sustainable development, the aspiration of Meridian Water is to go beyond policy, by achieving a zero waste, and carbon and biodiversity positive development.

It is much easier to set the vision and targets, than it is to deliver them in practice. Meridian Water will need to challenge many of the current norms of development, policy baselines and business-as-usual approaches. To be the greenest development in London and achieve climate commitments, a strong delivery strategy will be required. This will include:

- setting a communal governance framework, with clear roles, responsibilities, and accountability structures,
- facilitating cultural shifts through deep engagement, to ensure there is widespread buy-in to the vision and goals,
- capturing true whole life value by moving beyond traditional financing models,
- enabling innovation within the supply chain,
- effective use of accreditation, and
- strong project management processes including design briefs and reviews, procurement and engagement, risk and change management, oversight, audit and monitoring, sign off and approvals at each stage of the programme.

A strategy for delivering the vision is presented in the 'Implementing the Vision' chapter. The next section sets out the detailed objectives and requirements for a sustainable Meridian Water.

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## **Environmental Objectives and Requirements**

This section sets out the specific environmental sustainability objectives and requirements against each of the three key goals: Carbon Positive, Environment Positive and Zero Waste and Circular.

# Objectives and requirements overview

This section sets out the objectives and requirements against each of the three key goals to achieve the environmental sustainability vision.

The objectives and requirements are set out in a table composed of the following elements:

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Low energy use	Passive approach	CP.1.1	Minimise operational demand including for heating, hot water and electricity, regulated and unregulated energy	Prioritise passive design measures and take a fabric first approach.	>45% on-site reduction in regulated carbon dioxide emissions beyond Part L 2013.	>75% on-site reduction in regulated carbon dioxide emissions beyond Part L 2013.	100% reduction in regulated and unregulated carbon dioxide emissions ie. zero carbon (70 kWh/m2/yr maximum energy consumption)	2020 target set slightly beyond current GLA 35% on-site reduction. 2025 target inline with anticipated Future Home Standard. 2030 target based on recommendations by industry (RIBA, LETI). Equivalent carbon dioxide emissions of 35 kWh/m2/yr for an all-electric scenario is 4.76 kgCO2/m2/yr (using SAP 10.1 carbon factors).	2030 target recommended by RIBA and LETI.	NDLP Policy S12 Minimising greenhouse gas emissions: Major developments should be net zero carbon. Minimum on site energy use reduction of 35% beyond Building Regulations for major development, of which 10% (min.) for residential and 15% (min.) for non-residential should be achieved through energy efficiency measures (fabric first).				●	●	●
				Use low flow hot water outlets (European Water Label 'Green' rating) and waste water heat recovery systems. Use high efficiency mechanical ventilation heat recovery. Use low energy lighting and energy efficient appliances (minimum 'A rated'). Reduce performance gap and design using realistic predictions of regulated and unregulated energy use (in accordance with CIBSE TM54 or similar methodology).	Space heating demand < 30 kWh/m2/yr	Space heating demand < 20 kWh/m2/yr	Space heating demand < 15 kWh/m2/yr	2020 target equivalent to a 10% demand in regulated carbon dioxide emissions beyond Part L 2013. Assumes a Notional apartment with a space heating demand of 39 kWh/m2/yr (domestic hot water demand of 30 kWh/m2/yr and lighting, fans, pumps demand of 6 kWh/m2/yr). 2025 target inline with recommendations from Committee on Climate Change for new homes to deliver ultra-high levels of energy efficiency by 2025 at the latest. 2030 target based on recommendations by industry (Passivhaus Standard, LETI).	2030 target recommended by Passivhaus Standard and LETI.		Minimum improvement over TER will increase over time. This will be reflected in future updates to the London Plan.				●	●

How the objective and requirement relates to the sustainability framework and principles themes and a reference code.

Clear concise objectives and what is required to achieve the objective. Metrics provide a quantitative and measurable standard for delivering the objectives and requirements. Some metrics are applicable from the outset, others become incrementally more ambitious. The metric dates are set from when projects are launched.

The context for the objective and requirement and how it relates to current 'business-as-usual', policy baseline and best practice.

Typology to which the objective and requirement applies: site-wide, civil and/or green infrastructure and social, residential or commercial buildings. Refer to page 38 for more detail.

# Carbon Postive: Low energy use

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology						
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.	
												Civil	Green	Social			
Low energy use	Passive approach	CP.1.1	Minimise operational demand including for heating, hot water and electricity, regulated and unregulated energy	<p>Prioritise passive design measures and take a fabric first approach.</p> <p>Use low flow hot water outlets (European Water Label 'Green' rating) and waste water heat recovery systems.</p> <p>Use high efficiency mechanical ventilation heat recovery.</p> <p>Use low energy lighting and energy efficient appliances (minimum 'A rated').</p> <p>Reduce performance gap and design using realistic predictions of regulated and unregulated energy use (in accordance with CIBSE TM54 or similar methodology).</p>	>45% on-site reduction in regulated carbon dioxide emissions beyond Part L 2013.	>75% on-site reduction in regulated carbon dioxide emissions beyond Part L 2013.	100% reduction in regulated and unregulated carbon dioxide emissions ie. zero carbon (70 kWh/m2/yr maximum energy consumption)	<p>2020 target set slightly beyond current GLA 35% on-site reduction.</p> <p>2025 target inline with anticipated Future Home Standard.</p> <p>2030 target based on recommendations by industry (RIBA, LETI). Equivalent carbon dioxide emissions of 35 kWh/m2/yr for an all-electric scenario is 4.76 kgCO2/m2/yr (using SAP 10.1 carbon factors).</p>	2030 target recommended by RIBA and LETI.	NDLP Policy S12 Minimising greenhouse gas emissions: Major developments should be net zero carbon. Minimum on site energy use reduction of 35% beyond Building Regulations for major development, of which 10% (min.) for residential and 15% (min.) for non-residential should be achieved through energy efficiency measures (fabric first).					●	●	●
					Space heating demand < 30 kWh/m2/yr	Space heating demand < 20 kWh/m2/yr	Space heating demand < 15 kWh/m2/yr	<p>2020 target equivalent to a 10% demand in regulated carbon dioxide emissions beyond Part L 2013. Assumes a Notional apartment with a space heating demand of 39 kWh/m2/yr (domestic hot water demand of 30 kWh/m2/yr and lighting, fans, pumps demand of 6 kWh/m2/yr).</p> <p>2025 target inline with recommendations from Committee on Climate Change for new homes to deliver ultra-high levels of energy efficiency by 2025 at the latest.</p> <p>2030 target based on recommendations by industry (Passivhaus Standard, LETI).</p>	2030 target recommended by Passivhaus Standard and LETI.	Minimum improvement over TER will increase over time. This will be reflected in future updates to the London Plan.					●	●	●
	Smart systems / High efficiency technology	CP.1.2	Deploy smart controls to complement low carbon technologies and optimise supply and demand across the site.	<p>Integrate smart appliances able to respond to needs of the grid, reducing electricity consumption during peak times.</p> <p>Specify energy efficient and smart services, systems and appliances.</p>	In line with target as above for total energy / carbon targets			<p>Government aiming for all houses to have a smart meters by 2024.</p> <p>Installing smart controls and appliances goes beyond minimum policy requirements but complements efforts to reduce operational energy demand.</p> <p>Metering now requirement of GLA together with reporting</p>	<p>London Environment Strategy. Develop a lean and smart integrated energy systems using local and renewable energy sources.</p> <p>Clean Growth Strategy (2017): Roll out smart metering by 2020.</p>	Smart meters are not currently a policy requirement.	●						
									DNLP Policy S12 Minimising greenhouse gas emissions: major developments to monitor, verify and report on operational energy performance for a minimum of 5 years								

# Carbon Postive: Low carbon energy supply

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Low carbon energy supply	Low carbon energy supply	CP.2.1	Minimise carbon for heating and cooling and capitalise on air pumps, decentralised energy systems and on-site storage.	Specify low carbon heating and cooling systems.  Maximise opportunities for heat recovery across the site, including use of reservoirs and canals.  Optimise supply and demand across the site with load balancing technologies, decentralised energy storage, reduced substation sizes and on-demand site response.	<55°C heating system temperatures within the buildings including radiators (<55°C) and under floor heating (35-40°C). <i>Energetik temperature is higher but relates to the network not the heating systems inside buildings.</i>  Zero new connections to gas grid or use of fossil fuel boilers		Older buildings have heating systems with flow and return temperatures between 70-80°C. Within the past ten years, attempts to reduce this to 55-70°C. New recommendations is for below 55°C within buildings. Lower temperatures required to maximise efficiency of new systems including heat pumps and boilers. Reducing temperatures will allow to maximise efficiency of systems.	CIBSE/ADE Code of Practice CP1 or equivalent for heat networks  Standard also recommended in the London Heat Network Manual which Energetik followed.  LETI: Heating system requirement inside buildings	NDLP Policy SI3 Energy Infrastructure: Support innovative low carbon heat technologies, phase out installation of high carbon fuel heating starting with new homes, invest in innovation focusing on low carbon heat.  Future Homes Standard will ban new gas/fossil fuel boilers to new homes from 2025.	●						
	On-site renewables	CP.2.2	Maximise on-site renewable energy generation and distribution including across complete building skin.	PVs must be accommodated on roofs wherever appropriate  Enable residents to develop community-based low-carbon renewable energy systems.	30% minimum roof area for PVs		Maximising renewable energy production and distribution is required to achieve carbon neutrality by 2030.	LETI: maximise renewables so that 70% of the roof is covered (medium-large scale housing and schools)  London Environment Strategy: Develop a clean and smart integrated energy systems using local and renewable energy sources.  Enfield Climate Action Plan: Solar installation and overall target renewable energy 2% increase per annum for 10 years.	DNLP Policy SI2 Minimising greenhouse gas emission: maximise opportunities for renewable energy on site  Enfield Core Strategy: maximise on-site renewable energy production and distribution				●	●	●	



# Carbon Postive: Low embodied carbon

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
						Civil	Green	Social								
Low Embodied Carbon	-	CP.3.1	Minimise embodied and whole life carbon	<p>Maximise the use of low carbon, regenerative, secondary and recycled materials</p> <p>Make decisions based on whole life carbon appraisal</p> <p>Demonstrate how embodied carbon of concrete and steel has been significantly reduced</p>	<p>&lt;600 kgCO2e/m2 residential buildings</p> <p>&lt;800 kgCO2e/m2 non-residential buildings</p> <p>&lt;0.6 kgCO2e/kg for structural steel</p> <p>&lt;0.05 kgCO2e/kg for concrete</p>	<p>&lt;450 kgCO2e/m2 residential buildings</p> <p>&lt;650 kgCO2e/m2 non-residential buildings</p> <p>&lt;0.5 kgCO2e/kg for structural steel</p> <p>&lt;0.02 kgCO2e/kg for concrete</p>	<p>&lt;300 kgCO2e/m2 residential buildings</p> <p>&lt;500 kgCO2e/m2 non-residential buildings</p> <p>&lt;0.3 kgCO2e/kg for structural steel</p> <p>Ultra low-carbon concrete</p>	<p>Current embodied carbon benchmark values:</p> <p>860 kgCO2e/m2</p> <p>Mid-rise residential (6-10 storeys)</p> <p>1250 kgCO2e/m2</p> <p>High-rise residential (16-25 storeys)</p> <p>1030 kgCO2e/m2</p> <p>Mid-rise commercial (5-10 storeys)</p> <p>Source: <i>RICS Methodology to calculate embodied carbon of materials</i></p> <p>Best practice case studies that utilise low-carbon materials such as timber, demonstrate that values below the current benchmark can be achieved.</p>	<p>RIBA Sustainable Outcomes</p> <p>LETI Climate Emergency Design Guide</p> <p>RICS Whole Life Carbon Assessment for the Built Environment</p> <p>CEMFREE for cement content</p>	<p>NDLP Policy SI2 Minimising greenhouse gas emissions: Requires referable developments to calculate whole-life carbon assessment and demonstrate actions taken to reduce life-cycle carbon emissions, but does not set targets .</p>	●					
					<p>RICS whole life carbon (A-C):</p> <p>&lt;300 kgCO2e/m2 residential buildings</p> <p>&lt;500 kgCO2e/m2 non-residential buildings</p> <p>100% of structural steel to be from sustainably certified sources</p>								●	●	●	

# Carbon Postive: High impact offset

Theme	Sub-theme <i>(where applicable)</i>	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
High impact offset	-	CP.4.1	Invest in an offsetting framework to achieve a net zero carbon balance on an annual basis	Invest in renewable energy capacity and energy efficiency initiative on-site and within Borough, including SIL, fabric improvements to existing building stock and local community energy initiatives.  Follow Enfield offsetting approach, focused on three solutions: natural offsetting through green infrastructure, solar installation and wind technology where viable.	Develop offsetting approach that complies with NDLP including setting a tariff and identifying projects.	Offset to be applied to unregulated and embodied carbon as regulated operational energy should be zero.	Offsetting eliminated as the majority of carbon emissions eliminated through on-site measures.	Enfield Climate Action Plan: Offsetting section.	NDLP Policy SI2 Minimising greenhouse gas emissions: boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. Major developments should calculate and minimise unregulated emissions.  Enfield Climate Action Plan: Offset 585 tCo2e per year. Three options for offsetting: Natural offsetting through green infrastructure, solar installation, wind technology.	●						

# Carbon Postive: Low carbon transport

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Low carbon transport	Active travel	CP.5.1	Walking and cycling is the preferred mode of transport for short journeys on and off site.	<p>Prioritise walking and cycling during transport modelling design and planning.</p> <p>Create a safe, accessible, permeable and continuous walking and cycling network integrated with blue and green infrastructure.</p> <p>Consider whole user journey and include easily accessible and secure cycle storage, maintenance and repair facilities, showers, lockers etc.</p> <p>Use Transit Oriented Development (TOD) principles when designing active travel networks.</p>	<p>100% of residents within 400m of strategic cycle network</p> <p>1 cycle parking space per resident (including children)</p> <p>9/10 score based on TfL Healthy Streets Approach</p> <p>15mph limit on secondary roads 10mph on green streets</p> <p>By 2030: 80% of 1 mile journeys within Meridian Water by walking or cycling (excluding journeys by mobility impaired) &gt;80% of 1+ mile journeys by cycling and public transport</p> <p>30% Gold TOD standard 70% Silver TOD standard</p>			<p>Enfield scored 3.2 in 2019 on Healthy Score Approach. Haringey (other outer borough) scored 5.6. City of London (inner borough) scored 8.7.</p> <p>Current modal share for trips originating from LBE (2017): 31% walking/cycling (up from 7% in 2011) 49% car or motorcycle (up from 47% in 2011)</p> <p>In 2014, only 8% of adults cycled at least once per month in the borough.</p> <p>In 2014, 52 people killed or seriously injured in road accidents in the borough.</p>	<p>Enfield Climate Action Plan: residents within 400m of strategic cycle network 30% by 2021 61% by 2041</p> <p>TfL Healthy Streets</p> <p>London Cycling Design Standards: safety, directedness, comfort, coherence, attractiveness, adaptability.</p>	<p>NDLP Policy T1 Strategic approach to transport: 80% of all trips in London made by foot, cycle or public transport by 2041.</p> <p>NDLP Policy T2 Healthy streets: Build new walking and cycling and public transport networks. All cycle and walking networks should be permeable.</p> <p>NDLP Policy T5 Cycling: Deliver more cycle routes and follow London Cycling Design Standards.</p> <p>Mayor's Transport Strategy</p> <p>London Environment Strategy: Chapter 6: Encourage 20mph zones.</p>	●					
	Zero private cars	CP.5.2	Eliminate the need for private car ownership and encourage shared modes of transportation.	<p>Minimise car parking and give priority to accessible parking and shared transport platforms.</p> <p>Future proof parking areas for conversion to alternative uses.</p> <p>Promote various forms of shared transportation such as car sharing, bike rental etc. by partnering with existing providers.</p> <p>Support electrification of transport with a continuous network of charging points including facilitating smart grid development with vehicle to grid charging and/or communal battery installations.</p> <p>Introduce ULEZ with revenues invested in transport infrastructure.</p>	<p>&lt;60% Co2 emission reduction from transport and traffic volume compared to LBE baseline.</p> <p>100% private parking spaces to have electric charging infrastructure.</p> <p>100% active charging points for all taxi spaces.</p> <p>30% public parking spaces to have electric charging infrastructure</p> <p>100% of charging points to include vehicle to grid capability.</p> <p>0.25 maximum residential parking provision and per 2,000sqm commercial space.</p> <p>'No car' zones near schools and in tertiary/green roads.</p>			<p>Enfield has 1,520 on-street parking spaces, 254 pavement parking spaces and 63 EV charging points (only 4 on council-owned parking spaces). An extensive electric charging network is required to support a transition to EV.</p> <p>Parking provision for PTAL areas between 0 and 1 are up to 2 space per unit in suburban areas and 1.5 spaces per unit in urban. This needs to be lowered in order to encourage modal shift and release land for other use.</p>	<p>Leading active transport initiative such as 'Mini Holland' in Walthamstow and car-free developments such as BedZED in Sutton have resulted in a significant decline in car usage.</p>	<p>NDLP Policy T6 Car parking: At least 20% of spaces must have active charging facilities with passive provision for all remaining spaces. Car club spaces may be considered. Purpose built shared living space should be car free.</p> <p>Outer London Boroughs wishing to adopt more generous standards are required to do so through an evidence based policy. Avoid car dependency and make the most of existing parking.</p>	●					

# Carbon Postive: Low carbon transport

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Low carbon transport	Logistics	CP.5.3	Transport associated with logistics (deliveries, servicing, construction etc.) is low-carbon and consolidated.	<p>Ensure appropriate construction access throughout the development including using water assets.</p> <p>Explore provision of consolidation hub to support sustainable last mile deliveries and consult with IKEA and Tesco to determine preference, needs and flexibility.</p> <p>Explore waste consolidation options with electric vehicles.</p> <p>Businesses rely on low carbon modes of transportation for servicing and deliveries, whilst capitalising on water assets to move goods.</p> <p>Ensure provision for rapid charging points where adequate and hydrogen refuelling.</p>	<p>100% low-emission/low-carbon logistics vehicles</p> <p>85% of NRMM to be fitted with emission controls to reduce emissions and air pollution</p> <p>100% vehicles used during construction to be Euro 6</p> <p>100% of contractors and suppliers to be FORS Gold accredited.</p>			<p>No consolidation hubs in Enfield at the moment.</p> <p>Fleet for waste vehicles is not electric.</p>	<p>No specific benchmark but follow guidance for zero emissions last mile deliveries and consolidated hubs.</p> <p>Benchmark for vehicles: Euro 6 and FORS Gold.</p>	<p>NDLP Policy T7 Freight and servicing: Consolidation of distribution sites at all scales should be designed to enable 24 hour operation and support out of peak deliveries.</p> <p>Deliver modal shift from road to water or rail where possible.</p> <p>Provision for adequate servicing storage and deliveries including hydrogen refuelling.</p>	●					
	Public transport	CP.5.4	Public transport is the preferred mode of transport for longer journeys on and off site.	<p>Create a dense network of buses that are clean frequent reliable and accessible. Collaborate with TfL and LBE to ensure off-site network also provided.</p> <p>Promote Mobility as a Service (MaaS) to offer integrated transport service.</p> <p>Capitalise on water assets to move people.</p> <p>Potential to subsidise bus services for first residents to promote sustainable mobility at onset of development.</p>	<p>&lt;400m to a bus stop via safe pedestrian routes from every dwelling's main entrance</p> <p>100% electric buses or low emissions buses</p> <p>By 2030: &gt;80% of 1+ mile journeys by cycling and public transport</p>			<p>The new Meridian Water station opened in 2019, improving rail access. However the area still has a low PTAL score (1b very poor to 2 poor).</p> <p>London has the largest electric bus fleet in Europe with more than 200 electric buses as of September 2019.</p> <p>Current modal share for trips originating from LBE (2017): 3% underground / DLR 3% rail 14% bus / tram</p>		<p>NDLP Policy T3 Transport: capacity connectivity and safeguarding. Support capacity and connectivity improvements to the bus network.</p>	●					

# Carbon Postive: Low carbon consumption patterns

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology						
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.	
												Civil	Green	Social			
Low carbon consumption patterns	Low carbon supply chains	CP.6.1	Build the capacity and support low carbon supply chains, including Made in Enfield.	Seek suppliers and contractors who have taken steps to minimise their environmental footprint and embodied carbon, including investing in renewable energy.  Work with restaurants and local eateries to reduce carbon emissions associated with food processes (from production to disposal). This can include fiscal incentives and incremental steps to encourage reduction in meat consumption.				In 2019 London ranked as the most vegan-friendly place in the world with more than 152 vegan restaurants.  Only 3 vegan/vegetarian friendly restaurants in Enfield in 2020.  Incentivising restaurants to provide more vegan/vegetarian options encourages individuals to adopt more low-carbon food options. This also brings health benefits.  Enfield is developing a new approach to procurement to estimate and evaluate carbon emissions from our suppliers by 2021.  Relying on local supply chain promote the local economy and reduces scope 3 emissions.	BS 20400 2017	NDLP encourages the use of local supply chains and supports the local economy.	●						
	Low carbon lifestyles	CP.6.2	Create a mixed-use dense resilient community that supports live, work and play.	Reduce commuter journeys by facilitating home working and provision of co-working and shared spaces.  Support local production and consumption including local food, and reduce where possible transport emissions associated with imports. Ensure appropriate levels of solar variation for growing season of allotments.  Launch public engagement campaigns (such as food waste prevention, reusable nappies, community clothes swaps) and create simple guidelines to promote low-carbon economy and encourage positive behavioural change.				More than 119 locations in Enfield according to Regus website.		NDLP: Overall document aims to encourage eco-responsible behaviours  NDLP Policy G8: Food growing: protect allotment and encourage provision of space for urban agriculture. Identify sites for local food production.  London Environment Strategy: Mayor seeks to support sustainable behaviours.	●						

# Environment Positive: Resilient high-quality microclimate

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology							
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.		
											Civil	Green	Social					
Resilient high-quality microclimate	Comfortable buildings	EP.1.1	Achieve excellent daylight and sunlight levels	Achieve 'low' to 'medium' levels of Spatial Daylight Autonomy, sunlight and views as set out in BS EN 17037. Absolute minimum based on UK Annex criteria.  Demonstrate use of environmental modelling to optimise designs	Medium: Daylight - 50% sDA500/50 and 95% sDA300/50 Sunlight - 3 hours of direct sunlight exposure on March 21 Low: Daylight - 50% sDA300/50 and 95% sDA100/50 Sunlight - 1.5 hours of direct sunlight exposure on March 21 Minimum: Daylight - 50% sDA100/50 in bedrooms, 50% sDA150/50 in living rooms and 50% sDA200/50 in kitchens			Contributes to occupant health and wellbeing. Reduces energy use and therefore carbon emissions.	BS EN 17037	NDLP Policy D4 Housing Quality and Standards: provide sufficient daylight and sunlight, whilst avoiding overheating and minimising overshadowing.					●	●	●	
		EP.1.2	Mitigate risk of overheating in naturally ventilated buildings for current and future climate	Pass overheating criteria set out in CIBSE TM59 for residential buildings and TM52 for non-residential buildings	TM59: Criteria 1: For all habitable spaces the number of hours during which ΔT is greater than or equal to 1K during May-September shall not be more than 3% of occupied hours Criteria 2: For bedrooms the operative temperature shall not exceed 26°C for more than 1% of annual occupied hours (between 22:00 and 07:00)  TM52: Criteria 1: The number of hours during which ΔT is greater than or equal to 1K during May-September shall not be more than 3% of occupied hours. Criteria 2: The daily weighted overheating exceedance shall be less than or equal to 6 for every day Criteria 3: The indoor operative temperature should not exceed a ΔT of 4K			There is significant risk of overheating in new homes across all locations and typologies in the UK. <i>Source: Research into overheating in new homes, 2019, MHCLG</i>  The risk is exacerbated by climate change with projected temperature increases of 5-6°C by 2050 in London	CIBSE TM52 and TM59  Follow the cooling hierarchy in London Plan.	NDLP Policy S14 Managing Heat Risk: Energy strategy should reduce potential for internal overheating and reliance on air conditioning systems following the cooling hierarchy.					●	●	●	
		EP.1.3	All dwelling units dual aspect	Maximise dual aspect dwellings with opening windows on more than one façade.	>90% of all dwellings dual aspect. Target 100% 0% single aspect north facing or 3-bed dwellings			Dual aspect important for comfort of dwellers and complement passive design/fabric first/natural sunlight initiatives.		NDLP Policy D4 Housing Quality and Standards: maximise the provision of dual aspect dwellings and normally avoid the provision of single aspect dwellings  ELAAP Policy EL11: Minimise single aspect dwellings						●		
	Comfortable public realm and external spaces	EP.1.4	Achieve excellent daylight & sunlight levels	Achieve excellent daylight and sunlight access to the public realm, green spaces, play spaces and communal external amenity areas.  Control high levels of solar radiation in the height of summer.	>2 hours direct sunlight on the ground to 70% of open spaces and 50% of courtyard spaces on 21st March  >4 hours direct sunlight on the ground to play spaces on 21st March			A good microclimate is essential for making Meridian Water an attractive and comfortable place for people to live, work and visit all year around	BR209	NDLP Policy S14: Managing Heat Risk	●							
		EP.1.5	Control local wind speeds	Control local wind speeds and turbulence avoiding the creation of wind canyons and wind hotspots (downdraught around tall buildings).	Maximum wind speeds: 2.5 m/s for frequent seating areas <4.0 m/s for occasional seating areas <6.0 m/s for standing areas <8.0 m/s maximum wind speed for walking areas Pedestrian safety limit of 15 m/s				City of London Wind Microclimate Guidelines		●							
		EP.1.6	Mitigate urban heat island effect.	Mitigate the urban heat island effect through material selection, incorporation of urban greening, enhancement of the waterways and use of wind to flush heat.	Maximise the proportion of the year where there is "no thermal heat stress" ie where 9°C ≤ UTCI ≤ 26°C.				CIBSE TM52 and TM59  BS EN 17041	NDLP Policy S14: Managing Heat Risk: Development should minimise UHI.	●							

# Environment Positive: Continuous green and blue networks

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology							
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.		
												Civil	Green	Social				
Continuous green and blue networks	Green space	EP.2.1	Ample and accessible green space on everyone's doorstep	Green spaces must be multi-functional and provide a good mix of facilities.	>30% public green space (7 sqm/resident)			Meridian Water is seeking to be the 'greenest development in London' and deliver 'parklife on your doorstep'.	Enfield Parks and Open Space Strategy 2010-2020: 23.7 sqm/resident	Green space quantum and infrastructure strategies should be set by each London Borough.		●	●					
				Green spaces must benefit from optimised environmental design.	100m to a green space from every dwelling (at a minimum linear or pocket park as per public open space categorisation NDLP Policy G4 Table 8.1).		Green spaces are an essential part of placemaking and significantly contribute to value creation, climate resilience, biodiversity, community health and wellbeing and the quality of the neighbourhood.	Similar developments in London are delivering 25-35% green space.	NDLP Policy G1: Green Infrastructure and G4: Open Space protect open spaces, promote creation of new open spaces especially green spaces.									
				The quality and mix of green space should respond to the density and location within the masterplan.	100% of green spaces to achieve Green Flag Status		LBE Climate Action Plan prioritises green infrastructure for carbon offsetting.	Enfield has a green flag status for its eight existing parks										
			EP.2.2	Create a network of connected open spaces.	Connect open spaces by car-free, high-quality, safe pedestrian and cycle routes as part of Green Grid and Blue Ribbon networks.  Improve access to the Lee Valley Regional Park.	100% of dwellings with access to LVRP via green grid (within 100m of home)  100% of public green spaces across the site connected via green grid/blue ribbon network				NDLP Policy G1: Green Infrastructure  Green infrastructure strategies should be set by each London Borough.			●					
			EP.2.3	Consider and provide for long term management and maintenance of green spaces	Green spaces to be designed to minimise maintenance.  Demonstrate that resource have been set aside to support long-term maintenance and management of all green and blue infrastructure.	100% of green and blue spaces to have management and maintenance plan.		Successful green spaces are underpinned by good management and maintenance that ensure they continue to support health and wellbeing, and climate resilience.	CABE Managing green spaces, 2010	N/A			●					
		Urban greening	EP.2.4	Achieve high Urban Greening Factor	Maximise incorporation of urban greening elements including green roofs/walls, rain gardens and tree planting	0.4 minimum Urban Greening Factor (UGF) 0.5 target UGF		Incorporation of urban greening elements support climate resilience, biodiversity and a comfortable microclimate and will help deliver 'parklife on your doorstep'		NDLP Policy G5 Urban Greening: Aims to increase green cover as part of site and building design, including trees, green roofs, green walls and nature based sustainable drainage Recommended target of 0.4 for residential developments and 0.3 for commercial developments.	●							
			EP.2.5	Maximise green roofs	Green roofs must be provided wherever appropriate, with access made for all occupants from main cores and be of sufficient depth to support rainwater attenuation.  Integrate green roofs with PVs.	>50% green roofs across site								●	●	●		
			EP.2.6	Maximise tree planting	Provision for trees to be made to the public realm, streets, green spaces and shared external amenity spaces including roof gardens.  Specify native species that are resilient to climate change and diseases.  Work with stakeholders and the local community to provide training and encourage planting and proper management.	22% minimum tree coverage across Meridian Water  100% native species to all Strategic Green Infrastructure (over 0.5ha) and any green space east of the Lea Navigation (due to proximity to LVRP).  80% native species to all Strategic Green Infrastructure (under 0.5ha) and any green space west of the Lea Navigation.  70% native species street trees		London's 'urban forest' covers around 20% of the city and makes a vital contribution to improving air quality, sequestering carbon, reducing surface water flooding and supporting biodiversity <i>Source: London Environment Strategy, 2018</i>	22% of land area for tree planting London Environment Strategy, 2018  Right Place Right Tree approach	NDLP Policy G5 Urban Greening: trees included in urban greening elements  NDLP Policy G7 Trees and Woodlands: Protect London's urban forest and woodlands. Planting of additional trees should be included in new developments.	●							



# Environment Positive: Continuous green and blue networks

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Continuous green and blue networks	Play space	EP.2.7	Make Meridian Water child-friendly	<p>Locate play space in response to density, typologies, unit mix and population yield.</p> <p>Doorstep play must be provided within individual plots and/or green streets and located in areas not too exposed that receive good sunlight.</p> <p>Provide a variety of play options including informal and natural, adventure play, and sports recreation.</p> <p>Schools to include outdoor classrooms, wildlife areas, nature and trim trails.</p>	<p>10 sqm min. dedicated play equipment per child</p> <p>100% of residential properties within 400m of inclusive and active play space</p> <p>&gt;4 hours direct sunlight on the ground to play spaces on 21st March</p>			<p>There is currently a lack of active inclusive play space in Enfield.</p> <p>Play space contributes to health and well-being.</p>	<p>Mayor's Play and Informal Recreation SPG</p> <p>BRE209</p> <p>Good Growth by Design: Making London Child-Friendly</p>	<p>NDLP Policy S4 Play and Informal Recreation: 10sqm min. playspace per child.</p> <p>More detailed play and recreation quantum and strategies should be set by each London Borough.</p>	●					
	Growing space	EP.2.8	Enable local food production	<p>Community growing space should be provided in addition to private or communal external amenity space in accordance with the site wide strategy.</p> <p>Appropriate levels of solar variation over the growing season.</p>	<p>1.5% min. of total GDA</p>			<p>There are 32 allotment sites in Enfield, most of which have long waiting lists.</p> <p>Growing spaces promote healthy eating, physical activity and are sociable.</p>	<p>BREEAM HQM 2.5 Recreational Space: criteria 6-9.</p> <p>Enfield Open Space Assessment 2011 recommends 0.36ha per 1,000 population.</p>	<p>NDLP Policy G8 Food growing: borough development plans should encourage the provision of growing space within new developments and as a meanwhile use</p>			●		●	

# Environment Positive: Radical increase in biodiversity

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
					Civil	Green	Social									
Radical increase in biodiversity	-	EP.3.1	Maximise biodiversity net gain (BNG)	<p>Protect and enhance areas of ecological significance; provide compensation where any biodiversity loss occurs.</p> <p>Development must not impact on sites of ecological importance including Chingford Reservoir SSSI and Walthamstow Reservoir and Marshes SSSI.</p> <p>Maximise naturalisation of existing water bodies to support biodiversity.</p> <p>Create new habitats as part of the development of blue and green infrastructure.</p> <p>Sensitively integrate nesting and roosting areas into building design.</p> <p>Create a long-term management plan to eradicate invasive species.</p> <p>Specify native, climate resilient, disease resilient and locally grown planting.</p>	10% BNG	25% BNG	50% BNG	<p>Nature recovery is required to reverse the significant decline in biodiversity over the last century.</p> <p>Achieving 50% BNG will require integrating urban greening, trees and green and blue infrastructure throughout Meridian Water</p> <p>Significant BNG is being achieved by large scale developments in London, such as Kidbrooke Village.</p>	DEFRA Biodiversity net gain assessment guidance	<p>Environment Bill 2020: minimum 10% BNG</p> <p>NDLP Policy C6 Biodiversity and access to nature: Protect sites of importance for nature conservation, seek opportunities to create new habitats and address deficiencies.</p>	●					

# Environment Positive: Water sensitive design

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Water Sensitive Design	Flooding and SuDS	EP.4.1	Provide resilience to flooding that is integrated with enhancement of waterways, landscape and biodiversity	<p>Optimise use of ecological and amenity SuDS within public realm and landscape, following the London Plan hierarchy to reduce flood risk and improve surface water quality.</p> <p>Maximise opportunities for reducing on and off site flood risks.</p> <p>Improve floodplain storage and river capacity.</p> <p>Adapt peak discharge to river to catchment hydrology considering timing of storm and fluvial events.</p> <p>Surface flooding adapted to the land use type in line with BS EN 752</p>	100% buildings protected against 1:100+35% climate change flooding.	1:1000 year extreme event flooding to be considered for all buildings		In London, 68,499 residential properties are at risk of surface water flooding (1 in 30 year event) and 12,148 commercial properties are at risk (1 in 30 year event).	<p>Ciria C753: The SuDS manual (C697)</p> <p>Ciria C713: Retrofitting to manage surface water.</p>	<p>NPPF</p> <p>NDLP Policy SI12 Flood risk management</p> <p>NDLP Policy SI13 Sustainable Drainage</p> <p>Thames Estuary 2100 Plan</p>		●	●			
	Reduce water use	EP.4.2	Minimise mains water use.	<p>Specify low-flow fittings and appliances (WCs, taps, showers, white-goods).</p> <p>Provide leak detection systems.</p> <p>Develop and implement comprehensive metering strategy.</p> <p>Native drought resistant planting to minimise irrigation demand. Efficient irrigation strategy.</p>	100% low-flow fittings and appliances	100% buildings fitted with leak detection systems.		There is water stress in London and the Thames catchment.	<p>RIBA Sustainable Outcomes (CIBSE Guide G)</p> <p>HQM 8 Water.</p> <p>BREEAM Water 01 <i>Excellent</i>: 65% potable water use reduction against baseline</p>	<p>Building Regulations Part G: 125 l/p/d residential</p> <p>NDLP Policy SI5 Water Infrastructure: 105l/p/d residential</p>				●	●	●
		Reduce water use during construction		<p>Implement water re-use strategies for construction activities (e.g. dust suppression, concrete batching, washing and cleaning, establishment irrigation etc)</p> <p>Conduct baseline assessment to determine target for water use reduction.</p> <p>Install waterless urinals in facilities and water efficient establishment irrigation.</p>	<p>15-25% reduction in water use across construction site facilities.</p> <p>40% reduction in potable water use in wheel washing activities from baseline assessment.</p> <p>80% saving in potable water use for dust suppression by implementing water re-use strategies</p>	<105 l/p/d residential potable water consumption	<95 l/p/d residential potable water consumption	<75 l/p/d residential potable water consumption	<p>Current potable water use: 125 l/p/day for residential buildings (based on building regulations) 16 l/p/day for non residential buildings (based on CIRA W11 benchmark).</p>			●				

# Environment Positive: Water sensitive design

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology						
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.	
												Civil	Green	Social			
Water Sensitive Design	Rainwater harvesting	EP.4.3	Maximise rainwater harvesting	Integrate rainwater harvesting with site-wide sustainable drainage solutions using smart technology to harvest rainwater from attenuation capacity in material-efficient way. Consider whole life costs and benefits.	50% min. WC flushing demand met using non potable water (combining greywater and rainwater systems). Target 100%			The use of rainwater harvesting and greywater recycling systems reduces potable water demand, reducing water stress.	BREEAM HQM 8.1 Water Efficiency: 50-100% demand for WC flushing met by rainwater or greywater systems	NDLP Policy S15 Water infrastructure: Water supplies and resources should be protected and conserved.	●						
	Water recycling	EP.4.4	Maximise water reuse and recycling	Implement greywater recycling where justifiable on whole life costs and benefits - for example to reuse pool backwash filter to flush WCs in leisure centre  Explore with Thames Water site wide opportunity for reuse of treated effluent from Deepham wastewater treatment works for flushing WCs. Consider whole life costs and benefits.							●						

# Environment Positive: Low pollution

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology						
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.	
												Civil	Green	Social			
Low Pollution	Air	EP.5.1	Achieve Air Quality Positive	Minimise pollution sources and design effective flushing of pollutants (including dust during construction).  Focus on exposure of residents, school children and vulnerable communities to A406 and Meridian Water.	100% of Meridian Water area meets WHO air quality standards: Sulphur dioxide: 20 µg/m <sup>3</sup> (24 hours) Nitrogen dioxide: 40 µg/m <sup>3</sup> (1 year), 200 µg/m <sup>3</sup> (1 hour) PM <sub>10</sub> : 20 µg/m <sup>3</sup> (year), 50 µg/m <sup>3</sup> (24 hours) PM <sub>2.5</sub> : 10 µg/m <sup>3</sup> (year), 25 µg/m <sup>3</sup> (24 hours)			Air pollution has a big impact on health at all stages of life. A baby born in 2010 and exposed to that same level of air quality for its entire life would lose around two years of life expectancy. Mortality is not the only air pollution related health effect. In 2010, London air pollution was linked to over 3,000 hospital admissions. The economic cost of these health impacts in London is estimated as being up to £3.7bn a year.	WHO Air Quality Guidelines. Global update 2005.  EU Air Quality Directive.	London Plan SI1 Improving Air Quality: Development must demonstrate methods of achieving Air quality positive.  London Environment Strategy	●						
		EP.5.2	Be an air positive development and achieve high-levels of air quality internally.	Indoor air quality to WELL building standards	100% buildings meet indoor air quality WELL building standards: < 27 ppb formaldehyde levels < 500 µg/m <sup>3</sup> total volatile organic compounds			An air quality assessment undertaken by the Council identified that Government's air quality objective for annual mean NO <sub>2</sub> and daily mean PM <sub>10</sub> were not being met. Most air pollution is caused by road traffic.  Internal air quality is equally important for health and	WELL Building Standard	Mayor's Transport Strategy  Health Inequalities Strategy- Better Health for all Londoners  North London Sub Regional Transport Plan				●	●	●	
	Noise	EP.5.3	Minimise the negative impact of noise.	Assess and manage noise impacts in mixed use areas of development.  Use acoustic design and strategic positioning of spaces.	Noise pollution in line with Policy D13 of NDLP.  Create as many quiet area as possible.			The council has adopted a Low Traffic Neighbourhood approach where through motor vehicle traffic is discouraged or removed. Quieter Neighbourhoods contribute to delivering this vision. Council taking a phase approach with a total of 8 quiet area project with delivery expected in 2022.	Good acoustic design of the inside of buildings: BS 8223:2012 Institute of Acoustics: PG Planning and Noise (May 2017) for residential developments BS4214 provides guidance on monitoring noise in mixed residential/ industrial areas	NDLP Policy D13 Noise  Policy D12 Agent of Change: places responsibility for mitigating impacts of existing noise on new development	●						
		Water	EP.5.4	Control pollution to the water environment and improve water quality.		0 contamination to ground and surface water water during earthworks or other construction activities.						●					
Light	Light	EP.5.5	Minimise light pollution.	Develop a lighting strategy to minimise carbon emissions and light pollution.	100% lighting to meet Secure by Design standards.			Light pollution affects people, wildlife and the environment. It can interrupt sleep and cause health problems including fatigue, headaches and anxiety. Artificial lighting disrupts the natural behaviour of wildlife and so it is important to retain some dark areas to support biodiversity. Lighting also generates carbon emissions.  There are currently no dark sky areas in Enfield and only 3 in London.	City of London Light Pollution Guidance.  Secure by Design standards.		●						
				Minimise glare and pollution from buildings and spill into residential buildings.  Use smart systems and motion sensors to avoid unrequired lighting.  Create dark sky areas and corridors for wildlife and nature recovery.													



# Zero Waste and Circular: Use fewer resources

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
					Civil	Green	Social									
Use fewer resources	Lean and circular	ZW.1.1	Minimise whole life material use by following lean and circular design and construction strategies	Reduce material use by adopting lean and circular design principles throughout Meridian Water including: <ul style="list-style-type: none"> <li>long-life loose-fit</li> <li>layered building approach, where each layer has a different design life and set of requirements.</li> <li>lean design that maximises efficiency, reduces complexity and optimises material use</li> <li>standardise to enable ease of maintenance and value recovery</li> <li>design for durability</li> </ul>	See ZW.3.2 and CP.3.1			Reducing the demand for materials is an essential part of shifting away from our current linear economy to a circular economy is essential to address global resource depletion. .	Mayor of London Design for a Circular Economy Primer.	NDLP Policy SI7 Reducing waste and supporting the circular economy	●					
	Virgin materials	ZW.1.2	Minimise the use of virgin materials	Prioritise the specification of secondary and recycled materials  Prioritise standardised materials, products and components and MMC to optimise material use. A 'kit-of-parts' approach should be considered.	>20% of all construction materials (by volume) are regenerative or secondary	>30% of all construction materials (by volume) are regenerative or secondary	>40% of all construction materials (by volume) are regenerative or secondary	Increasing demand for secondary materials will increase supply and decrease extraction & supply of virgin materials.  Innovative projects are demonstrating that the majority of materials can be secondary, including entire brick facades, external window systems, and timber components such as flooring and decking.	London Environment Strategy: reduce the amount of virgin materials required and maximise recycling  CIRCUI T supports regenerative cities by implementing sustainable and circular construction practices.		●					
	Material sourcing	ZW.1.3	Materials to be sustainably, responsibly and ethically sourced	All materials must be sustainably sourced.  All resources to be sourced from ethical and responsible supply chains.	100% of virgin timber FSC certified (or UK equivalent) 100% Responsible Steel™ 100% of materials covered by BRE Responsible sourcing certification to be BES 6001 accredited  By 2030 all materials and products to have EPD or similar				Certified responsibly and sustainably sourced materials and products are becoming increasingly available, and it is expected that more products will have EPD, cradle-to-cradle certification or equivalent in coming years.		BES 6001 Responsible sourcing of construction products	●				

# Zero Waste and Circular: Design out waste

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology						
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.	
												Civil	Green	Social			
Design out waste	Prevent waste	ZW.2.1	Reduce waste generated across the whole life of Meridian Water	Follow the waste hierarchy.  Become self-sufficient in dealing with waste.  Produce a Waste Strategy covering both construction and operational waste, setting out how targets will be achieved	See ZW.2.2 and ZW.2.3			By reducing waste and becoming self-sufficient in dealing with waste Meridian Water will reduce carbon emissions and has the potential to reduce the cost of waste management.	London Environment Strategy: significantly reduce waste and become self sufficient	NDLP Policy SI7 Reducing waste and supporting the circular economy: Zero biodegradable or recyclable waste to landfill by 2026 65% recycling by 2030 95% reuse/recycling/ recovery of construction and demolition waste 95% beneficial reuse of excavation waste							
	Construction waste	ZW.2.2	Minimise construction waste	Prioritise the retrofit of existing assets where possible.  Maximise opportunities for materials optimisation, reclamation, and reuse.  Minimise packaging, off cuts, damage and rework onsite and use off-site, precision manufacture, just-in-time delivery and secure on-site storage.  Minimise dig areas, re-use excavated material on site and use recycled fill.  Final site levels to respond to final cut and fill quantum and the quality of the materials produced through the re-profiling of the site and any earthworks.  Eliminate all waste associated with construction through good design and delivery processes.	<50m <sup>3</sup> /£100k project value for infrastructure/civil contracts	<40m <sup>3</sup> /£100k project value for infrastructure/civil contracts	<30m <sup>3</sup> /£100k project value for infrastructure/civil contracts	In London the construction industry accounts for 54% of waste.  Across the UK construction waste represents £6bn lost value from £100bn annual industry turnover.  Reducing construction waste could result in £5m cost savings, 7,760t Co2e saving and 122,000t of virgin material use avoided.  Current waste volumes: 52.3m <sup>3</sup> /£100k infrastructure/civil 17.3m <sup>3</sup> /£100k residential 8.4m <sup>3</sup> /£100k commercial Source: BRE Developing a strategic approach to construction waste	WRAP Design Out Waste guides set out measures for reducing waste and subsequently costs, in the built environment	Waste Duty of Care: Code of Practice, 2018	●						
	Operational waste	ZW.2.3	Minimise operational waste	Engage future users in the design process to minimise redundancies  Reduce the amount of waste generated throughout the whole life of Meridian Water.  Design for low maintenance and convenient maintenance	<350kg/capita/yr Municipal Solid Waste (MSW)	<265kg/capita/yr MSW	<180kg/capita/yr MSW	Current MSW arising in Enfield is 350kg/capita/year  Local Authority Waste Statistics 2017/18				●					
	Single-use plastics	ZW.2.4	Eliminate single use plastics	Establish Meridian Water as a 'plastic free zone'  Mandate reporting use of single-use plastic from 2020 and move towards eliminating single-use plastic	>60% of plastic (by volume) used in construction and during operation is recycled  >90% single-use plastic is reported	>75% of plastic (by volume) used in construction and during operation is recycled	>95% of plastic is recycled	NLWA launched 'Low Plastic Zones' in 2020 across seven north London Boroughs  London Environment Strategy states that less than 50% of plastic in the UK is currently recycled	Canary Wharf has been awarded 'Plastic Free Communities' status as a result of its 'breaking the plastic habit' programme to eliminate single-use plastic.			●					

# Zero Waste and Circular: Value waste

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Value Waste	Construction waste	ZW.3.1	Maximise value recovery during construction, excavation and demolition	<p>CD&amp;E waste management strategy to achieve excellence.</p> <p>Implement smart waste systems.</p> <p>Conduct a pre-demolition audit and prepare a demolition strategy to segregate waste.</p> <p>Ensure low contamination of waste streams during transfer and processing.</p> <p>Recover waste as high up the value chain as possible.</p> <p>Maximise value recovery through reuse and recycling.</p>	<p>&gt;95% of identified non-hazardous waste reused or recycled</p> <p>&gt;97% of identified non-hazardous waste reused or recycled</p> <p>&gt;98% of identified non-hazardous waste reused or recycled</p>	<p>&gt;97% of identified non-hazardous waste reused or recycled</p> <p>&gt;98% of identified non-hazardous waste reused or recycled</p>	<p>&gt;98% of identified non-hazardous waste reused or recycled</p>		<p>BREEAM Waste</p> <p>BREEAM: Exemplary level: 95% of C&amp;D waste diverted from landfill by tonnage</p> <p>Use CEEQUAL formula for metric measurement (Section 7.1.10)</p> <p>ICE Demolition Protocol 2008 for pre demolition audit.</p>	<p>NDLP Policy SI7 Reducing waste and supporting the circular economy: Zero biodegradable or recyclable waste to landfill by 2026</p> <p>65% recycling by 2030</p> <p>95% reuse/recycling/ recovery of construction and demolition waste</p> <p>95% beneficial reuse of excavation waste</p> <p>Waste Duty of Care: Code of Practice, 2018</p>	●					
	Operational waste	ZW.3.2	Maximise value recovery in operation	<p>Recover waste as high up the value chain as possible.</p> <p>Maximise value recovery through reuse and recycling.</p> <p>Segregate waste materials into fractions at source. Allow ample space for waste segregation and storage.</p> <p>Ensure low contamination of waste streams during transfer and processing.</p> <p>Support and enable processing of waste, including organic materials, into new materials.</p> <p>Safely feed materials back into biological processes via composting and anaerobic digestion.</p> <p>Enable ecosystems that support circular economy businesses.</p> <p>Innovation including for example smart bins, smart controls to chutes and bin stores, smart bins, good clear signage, compaction, in-vessel composting etc. can help improve recycling rates, support better use of waste facilities, reduce space take and optimise collection.</p>	<p>100% of homes connected to 3-stream in-home waste collection (organics, mixed dry recyclables, residual)</p> <p>100% of homes within 400m of a 'neighbourhood waste/material exchange' to collect, exchange, repair or share electronics, textiles, furniture/bulk, chemical</p>	<p>100% of homes and businesses have direct access (at neighborhood level or through on-demand service) to material recovery network for any material</p>	<p>100% of homes and businesses have direct access (at neighborhood level or through on-demand service) to material recovery network for any material</p>	<p>Average waste system is currently 3 streams.</p> <p>Additional segregated waste streams makes it easier for residents to recycle properly, reduces contamination and improves recycling rates.</p> <p>41% household and commercial recycling rate across London <i>Source: London Environment Strategy</i></p> <p>36% household recycling rate in Enfield in 2017/18</p> <p>Enfield Climate Action Plan: 49% kerbside recycling rate by 2022</p>	<p>London Environment Strategy</p> <p>Waste Framework Directive: 50% recycling of household waste</p>	<p>NDLP Policy SI7 Reducing waste and supporting the circular economy: Zero biodegradable or recyclable waste to landfill by 2026</p> <p>65% recycling by 2030</p> <p>NDLP Policy D4 Housing Quality and Standards: adequate and easily accessible storage for dry recyclables, food waste and residual waste</p>	●					
					<p>&gt;50% recycling of household and commercial waste</p> <p>&gt;65% recycling of household and commercial waste</p> <p>&gt;80% recycling of household and commercial waste</p>	<p>&gt;65% recycling of household and commercial waste</p> <p>&gt;80% recycling of household and commercial waste</p>	<p>&gt;80% recycling of household and commercial waste</p>				●					
					<p>&lt;15% of total waste send to WIE</p> <p>&lt;10% of total waste send to WIE</p>	<p>&lt;15% of total waste send to WIE</p> <p>&lt;10% of total waste send to WIE</p>	<p>&lt;10% of total waste send to WIE</p>				●					
					<p>75% of recyclable materials diverted from landfill (including post-processing)</p> <p>&gt;85% of all waste diverted from landfill</p> <p>&gt;95% of all waste diverted from landfill</p>	<p>&gt;85% of all waste diverted from landfill</p> <p>&gt;95% of all waste diverted from landfill</p>	<p>&gt;95% of all waste diverted from landfill</p>				●					
					<p>&gt;90% of all organic waste (by volume) processed via composting or anaerobic digestion or processed into new materials</p>	<p>&gt;90% of all organic waste (by volume) processed via composting or anaerobic digestion or processed into new materials</p>	<p>&gt;90% of all organic waste (by volume) processed via composting or anaerobic digestion or processed into new materials</p>				●					

# Zero Waste and Circular: Design for circularity

Theme	Sub-theme (where applicable)	Ref.	Objective	Requirement	Metric			Context	Best practice benchmark	Policy baseline	Typology					
					2020	2025	2030				Site-wide	Infrastructure			Resi.	Comm.
												Civil	Green	Social		
Design for Circularity	Service models	ZW.3.1	Maximise Product-as-a-Service (PaaS) agreements	Specify PaaS and engage with the supply chain to develop take-back and remanufacturing/reuse agreements with environmental based contracting.		10% of components (by value) leased and/or returned to manufacturer.	15% of components (by value) leased and/or returned to manufacturer.	PaaS and take-back agreements are becoming increasingly available, including: Philips lighting, Desso and Interface flooring.  Innovative projects are pioneering PaaS agreements on larger building elements: façade leasing at TU Delft and a 100% leased struture and fit-out at Brummen Town Hall.	UKGBC Guidance for PaaS for clients	NDLP Policy SI7 Reducing waste and supporting the circular economy	●					
	End of life	ZW.3.2	Eliminate waste at end of life	Design for disassembly. Include a disassembly plan as part of Circular Economy statements.  Produce a Building Material Passport.  Specify materials and components that are: • non-toxic • can be safely fed back into biological processes via composting or anaerobic digestion • can be easily recovered for reuse, remanufacture and recycling	>50% of components are captured by disassembly plan	>60% of components are captured by disassembly plan	>80% of components are captured by disassembly plan	Increasing complexity of construction methods and components and methods is inhibiting end of life disassembly and material recovery. By adopting a layered approach (see ZW.1.1), reducing complexity, prioritising standard components and designing for disassembly eg. using mechanical connections, materials and components can be more readily recovered for maintenance, repair or recovery.	Materials Passports Best Practice, Buildings as Materials Banks, 2019		●					
		ZW.3.3	Maximise value by extending the life and utilisation of resources	Ensure construction materials and spaces are fully utilised over their life cycle  Support a sharing economy in operation  Connect with existing community reuse networks	>1 no. Library-of-things and Repair Café for Meridian Water (Ref ZW2.4 - 100% of homes connected to 'material hubs' at each neighborhood to collect, exchange, repair or share electronics, textiles, furniture/bulk, chemical 'wastes')  1 no. innovation hub (co-funded by the council and developers) for Meridian Water to identify and develop on-site opportunities for maximising value by extending the life and utilisation of resources  1 no. local co-working space per neighbourhood			The sharing economy is growing as part of supporting more sustainable lifestyles. Meridian Water should provide the space and infrastructure to support the sharing economy. This should include co-working space, especially with a significant increase in home working as a result of the Covid-19 pandemic.			●					



# Applying the objectives and requirements

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The Environmental Sustainability Strategy sets high level objectives and requirements that are applicable across all sectors and scales of the Meridian Water development.

## Infrastructure

The infrastructure categories align with the infrastructure types set out in the Infrastructure Delivery Strategy, July 2020.

- Civil infrastructure includes roads and streets, junctions, bridges, cycle routes, public realm, earthworks, remediation, flood alleviation, utilities and drainage.
- Green infrastructure includes open space, public realm, parks and urban greening.
- Social infrastructure includes education, arts and culture, sports and leisure, health and community buildings.

More detailed and specific objectives and requirements were developed in February 2020 for incorporation in the Strategic Infrastructure Works tender information. These requirements should be referred to in addition to this strategy for all Strategic Infrastructure Works projects.

## Residential development

Meridian Water is a residential-led scheme and the majority of the objectives and requirements set out in this strategy will be applicable to residential development from a phase and building scale through to individual units.

The requirements are applicable to all housing typologies and types including units for private sale or rent, affordable housing, purpose build-to-rent schemes, student housing, co-living, intergenerational and older living schemes.

Given the high level nature and broad scope of the objectives and requirements it will be important that they are reviewed, tailored and embedded in individual residential project briefs.

## Commercial Buildings

The objectives and requirements applicable to commercial buildings primarily consider office and retail uses, but can also be applied to light industrial and makers spaces. As more detailed briefs and masterplan proposals emerge for the range of commercial and industrial spaces it will be necessary to review and develop the objectives and requirements to ensure they are apt and address the full range of building typologies and spaces.

## Meanwhile uses

Meanwhile projects should strive to achieve the same sustainability goals as long-term and permanent projects. Given their short design lives there is particular opportunity for meanwhile projects to adopt circular design approaches and ensure they are designed for re-use, recoverability and/or disassembly. Some of the objectives and requirements may be challenging and/or unfeasible to achieve for meanwhile projects, for example those that necessitate substantial upfront investment that may not be recoverable over shorter design lives. The objectives and requirements should be reviewed, tailored and embedded in individual meanwhile project briefs

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## **Social value and co-benefits**

This section sets out how adopting this sustainability strategy will deliver value that goes beyond purely environmental benefits. Meridian Water will be home to engaged and empowered citizens, who benefit from high-quality education opportunities and participate in meaningful employment. Community and social value will be enhanced as people lead active lifestyles within a clean and healthy environment, which is well connected, both physically and digitally.

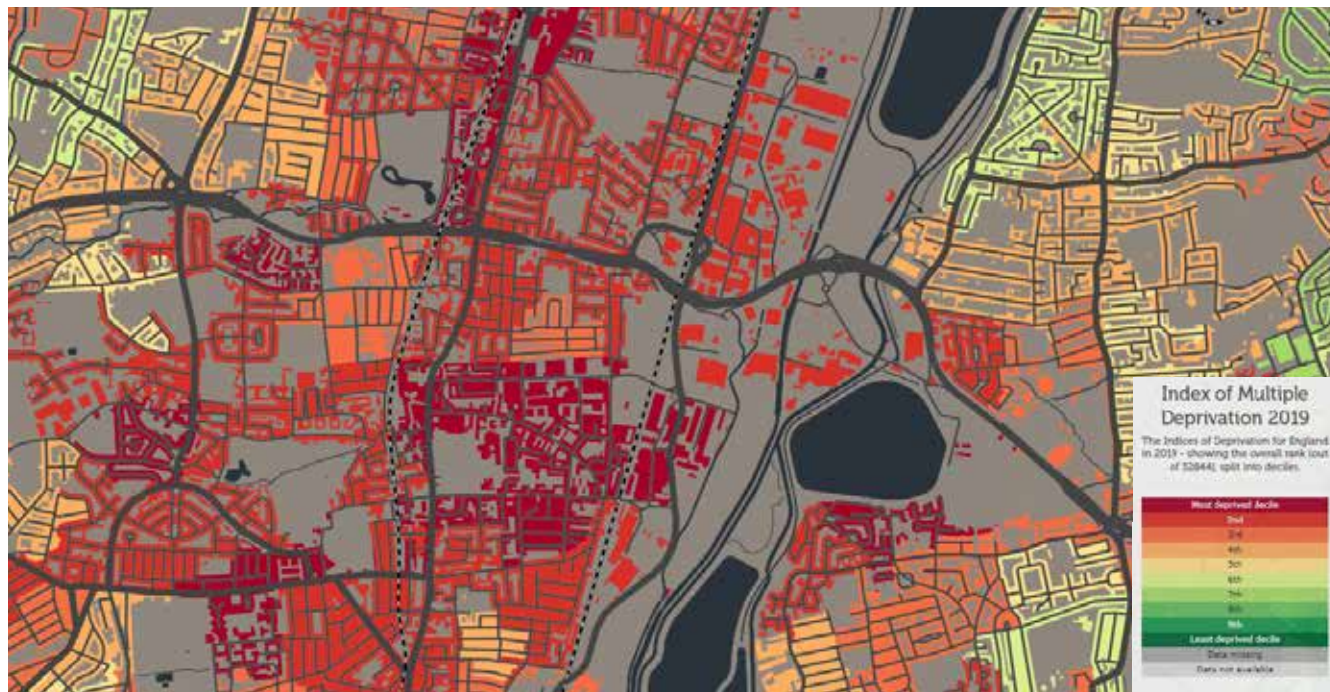
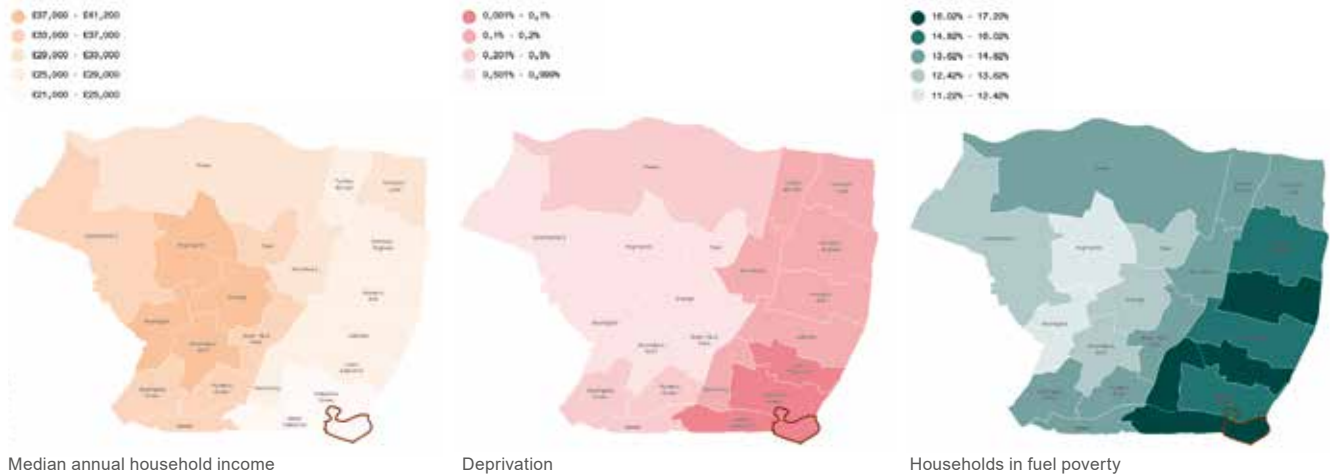
# Social Context

Meridian Water is located in Edmonton, which includes neighbourhoods that face some significant challenges around social deprivation, and is ranked in the 20% most deprived areas in England. A Local needs assessment has been undertaken by the Social Value Portal. This highlighted the following key local issues:

- high unemployment (particularly young people)
- low school attainment
- high levels of crime and anti-social behaviour
- childhood obesity
- low income levels
- poor air quality
- poor digital connectivity

There is a huge opportunity at this site to positively benefit the area, in terms of promoting local employment and skills, and creating strong, healthy, and safe communities, all whilst supporting responsible economic growth across Enfield.

There is an intrinsic link between environmental sustainability and building social value. Taking an integrated approach to applying the three thematic goals set out in the previous sections (carbon positive, environment positive, zero waste and circular) will deliver multiple benefits; this is the most effective way to address the specific challenges found at this site.

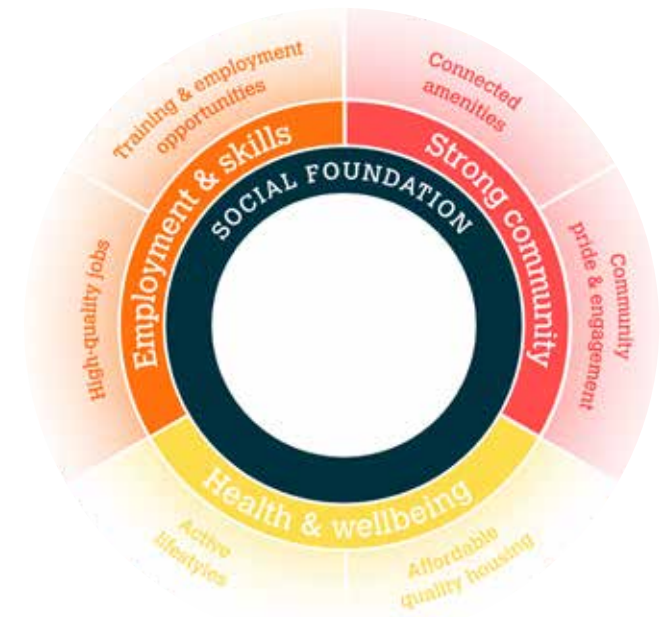


Index of multiple deprivation

# Social themes and objectives

In successful developments of this scale, value is created on three levels: what you build (the design), how you build (construction) and operation (in use over whole lifetime). The potential for impact is greatest at the earliest stages of the project (ideally pre-RIBA 0). A clear Social Sustainability Strategy should be developed, based on a needs-based approach. The Sustainability Strategy will set the 'social foundation' for the Meridian Water development and could include the themes and KPIs set out below.

As part of the Social Sustainability Strategy, the Council should put in place framework for monitoring these co-benefits, over time. As part of this, it may be beneficial to use the Social Return on Investment (SROI) methodology to set specific targets and monitor progress as the scheme is designed, constructed and inhabited. A key consideration when establishing a framework and setting targets is to ensure that there are at least some KPIs that can be monitored as the project develops, rather than relying on post-completion data.



## Strong and Connected Community

### Community Pride and Engagement

- Crime statistics (actual and perception of)
- Quality of life indicators
- Participation in community consultation events
- Volunteering

### Connected Amenities

- % Car free journeys
- % Properties with high speed broadband
- PTAL score
- % Journeys by each public transport mode
- Distances from local amenities (schools, shops etc.)

## Employment and Skills

### High Quality Jobs

- No. of jobs (during construction and long-term operation)
- Local / SME procurement
- Average hourly pay for jobs on site
- Employment figures %

### Training and Employment Opportunities

- % Apprenticeships filled by locals
- Number taking part in education/training in past year on site (excluding FTE)

## Health and Wellbeing

### Affordable Quality Housing

- % Affordable homes
- Number of people from local housing list given home in Meridian Water
- % Satisfied with homes

### Active Lifestyles

- Health deprivation indicators
- % Childhood obesity
- Distance from sports facilities
- Play space per child (m2)

# Approaches to social value generation

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Assessing the needs of the local community can help inform the approach to creating social value through the design, construction and operation of Meridian Water. We have set out below examples of approaches that can be taken to support social value creation. Refer to the 'sustainable development precedents section' for precedent case studies.

## What you build

- Focus on improving health and wellbeing of residents through the inclusion of a range of different green spaces.
- Include measures to improve air quality
- Using the principles of the Circular Economy, incorporate a range of flexible spaces which can be adapted to support SMEs as they grow.
- Create homes that can adapt to different times in people's lives.
- Prioritise active travel solutions.

## How you build

- Use local designers and makers working eg. Building BloQs to design and install site elements such as street furniture, playgrounds, bridges.
- Use the opportunity to upskill on modern methods of construction and zero carbon energy solutions, skills in short supply.
- Partner with local organisations to identify opportunities for reuse of materials from demolition.
- Support the procurement of SMEs and social enterprises in the design and construction supply chain with expertise in sustainable development and products.

## Operation

- Consider a community stake in local energy services or significant role within governance structures.
- Create new employment in landscape and biodiversity management.
- Establish a Community Parks Trust to ensure the ownership and maintenance of green spaces.
- Employ local community in Post Occupancy Evaluation and monitoring to ensure development meets its sustainability objectives in the long term.

Additional information on routes to procurement and overcoming some of the challenges typically faced in realising sustainable development is provided in the next section (Implementing the vision).



## Co-benefits: Passive

The following tables set out some of the high-level co-benefits of adopting the approaches set out in this strategy, in terms of environmental, social and economic value. They also present examples of financial models and delivery approaches that can support a triple bottom line approach to sustainable development.

Environmental Value	Co-Benefits (social value)	Financial Considerations	Delivery Considerations
<ul style="list-style-type: none"> <li>Reduced embodied and operational carbon emissions.</li> <li>With space heating demand of less than 15kWh/m<sup>2</sup>/yr, can achieve a 20-35% reduction in Co<sub>2</sub> compared to Part L Building Regulations.</li> <li>Ultra energy efficiency since space heating represents 75% of total energy used by a home. Reducing space heating demand has the greatest impact on reducing a home's total energy consumption.</li> </ul>	<ul style="list-style-type: none"> <li>Passive design significantly lowers energy bills for occupiers, resultant benefits may include reinvestment of savings in the local economy and a reduction in fuel poverty (suffered by 16-17% of households in the local ward).</li> <li>High-quality build ensures homes are comfortable and healthy all year round with good indoor air quality, no draughts, damp or condensation, always warm without over-heating, and excellent sound separation and privacy.</li> <li>Increases the longevity of buildings, contributing to climate resilience and future-proofing.</li> <li>Builds skills in green industries and low-carbon construction</li> </ul>	<ul style="list-style-type: none"> <li>The 15 kWh/m<sup>2</sup>/yr passive performance requirement has been developed to optimise the return on investment in improved building envelope against reduced heating loads.</li> <li>Achieving passive standards typically increases capital costs by circa 5%, which are recovered many times over in operational cost savings.</li> <li>Extremely low running costs makes homes easier to market and developers can charge a premium (up to 14%). It brings strong reputational value.</li> <li>Passive design now means no costly retrofit upgrades later on to comply with legislations. Better to invest in high quality building fabric rather than technologies that will need maintenance and replacement.</li> <li>Off-site modular construction that support achieving passive standards can save 10-25% in building costs compared to on-site construction.</li> <li>Green investment and grant funding may be available to support passive projects</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the performance gap between design and operation. Passive house projects are proven to perform on average exactly as modelled.</li> <li>The earlier a commitment is made to build passive the less costly it will be. Engage with contractors early on.</li> <li>Passive design allows for design flexibility and is open to any construction methods. Allows to tap into local craftsmanship and creates local jobs.</li> <li>Passive buildings are simpler to built with fewer mechanical components and require less maintenance. This delivers cost savings.</li> <li>Design can also be optimised to reduce costs. For example corridor services centralised in a building.</li> <li>Maximise value created through procurement processes.</li> </ul>

### Sources:

Bosenick, F. (2017). What are the Benefits of Passive House Buildings? [online] iPHA. Available at: <https://blog.passivehouse-international.org/benefits-passive-house-buildings/> [Accessed June 2020].

De Jong, R. (2018). The Business Case for Passivhaus. [online] Urban Land Institute UK. Available at: <https://uk.uli.org/business-case-passivhaus/> [Accessed June 2020].

LETI (2020). Climate Emergency Design Guide: How New Buildings Can Meet UK Climate Change Targets. [pdf] LETI. Available at: [https://b80d7a04-1c28-45e2-b904-e0715cfce93.filesusr.com/ugd/252d09\\_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf](https://b80d7a04-1c28-45e2-b904-e0715cfce93.filesusr.com/ugd/252d09_3b0f2acf2bb24c019f5ed9173fc5d9f4.pdf) [Accessed June 2020].

Passivhaus Trust (2019). Passivhaus Construction Cost. [pdf] Passivhaus Trust. Available at: [https://www.passivhaustrust.org.uk/UserFiles/File/research%20papers/Costs/2019\\_10\\_Passivhaus%20Construction%20Costs.pdf](https://www.passivhaustrust.org.uk/UserFiles/File/research%20papers/Costs/2019_10_Passivhaus%20Construction%20Costs.pdf) [Accessed June 2020].

Passivhaus Trust (2019). Passivhaus Social Housing: Maximising Benefits, Minimising Costs. [pdf] Issuu. Available at: [https://issuu.com/passivhaus\\_trust/docs/ph\\_social\\_finalwebv3/8](https://issuu.com/passivhaus_trust/docs/ph_social_finalwebv3/8) [Accessed June 2020].

## Co-benefits: Low embodied carbon

Environmental Value	Co-Benefits (social value)	Financial Considerations	Delivery Considerations
<p>Potential embodied carbon savings:</p> <ul style="list-style-type: none"> <li>• 5% reduction with efficient building design</li> <li>• 20% reduction by changing building elements' specification</li> <li>• 10% by designing for less waste on site</li> <li>• 10% by designing for off-site construction</li> <li>• 20% by selecting materials with lower carbon intensities</li> <li>• 10% by selecting reused and higher recycled content materials</li> <li>• 80% Co2e reduction can be achieved depending on which concrete is used, and how much is used.</li> <li>• 70% reduction in Co2e can be achieved depending on type of cement chosen.</li> <li>• 60% reduction in Co2e can be achieved depending on type of steel chosen.</li> <li>• Switching from steel or concrete to timber drastically reduces embodied carbon and can be carbon positive when sequestered carbon is considered.</li> </ul>	<ul style="list-style-type: none"> <li>• Contributes to Meridian Water becoming an eco-innovation centre and circular hub.</li> <li>• Focus on local sourcing and processing of materials will support local businesses, create training and employment opportunities and increase local investments.</li> <li>• Use of natural, non-toxic materials (such as timber) supports improved health and well-being.</li> </ul>	<ul style="list-style-type: none"> <li>• Low embodied carbon buildings provide a positive financial return over a 25 year life cycle.</li> <li>• Innovative construction methods, including MMC, support faster, more economical construction and delivers higher quality.</li> <li>• Choosing lightweight structures and reducing the amount of concrete used can significantly reduce structural costs</li> <li>• Switching to timber and other lighter materials can reduce foundation costs.</li> <li>• Lean design approaches reduce embodied carbon, but also reduce materials use and waste to generate cost savings.</li> <li>• Can contribute to reduction in offset payments.</li> <li>• Additional investment required at design stage to properly develop proposals.</li> <li>• Green investment and grant funding may be available to support low embodied carbon projects.</li> </ul>	<ul style="list-style-type: none"> <li>• Use whole life-cycle costing to identify most significant and cost-effective opportunities to reduce embodied carbon.</li> <li>• Enable innovation throughout the supply chain to develop viable low embodied carbon solutions</li> <li>• Client may be able to share some of the risk through contracts</li> <li>• Programme must allow time for good design that exceeds current industry standards, including maximising structural efficiency, design for off-site construction, design for reuse and deconstruction and use of low carbon materials and construction methods.</li> </ul>

### Sources:

Canada Green Building Council, (2020). Making the Case for Building to Zero Carbon. [online] Available at: [https://www.cagbc.org/CAGBC/Zero\\_Carbon/Report\\_\\_Making\\_The\\_Case\\_For\\_Building\\_To\\_Zero\\_Carbon/CAGBC/Advocacy/making\\_the\\_case\\_for\\_building\\_to\\_zero\\_carbon.aspx?hkey=3efa945b-07a4-465a-ad05-1fd0a14e57bb](https://www.cagbc.org/CAGBC/Zero_Carbon/Report__Making_The_Case_For_Building_To_Zero_Carbon/CAGBC/Advocacy/making_the_case_for_building_to_zero_carbon.aspx?hkey=3efa945b-07a4-465a-ad05-1fd0a14e57bb) [Accessed June 2020]

Connaughton, L., Weight, D., & Jones, C. (2019). Cutting Embodied Carbon in Construction Projects. [pdf] Wrap. Available at: <http://www.wrap.org.uk/sites/files/wrap/FINAL%20PRO095-009%20Embodied%20Carbon%20Annex.pdf> [Accessed June 2020].

Hamilton, K. (2017). Economic Co-Benefits of Reducing Co2 Emissions Outweigh the Cost of Mitigation for most Big Emitters. [online] LSE Grantham Research Institute on Climate Change and the Environment. Available at: <http://www.lse.ac.uk/GranthamInstitute/news/economic-co-benefits-of-reducing-co2-emissions-outweigh-the-cost-of-mitigation-for-most-big-emitters/> [Accessed June 2020].

LETI (2020). Embodied Carbon Primer: Supplementary Guidance to Climate Emergency Design Guide. [pdf] LETI. Available at: [https://b80d7a04-1c28-45e2-b904-e0715cf93.filesusr.com/ugd/252d09\\_8ceffbcfafdb43cf8a19ab9af5073b92.pdf](https://b80d7a04-1c28-45e2-b904-e0715cf93.filesusr.com/ugd/252d09_8ceffbcfafdb43cf8a19ab9af5073b92.pdf) [Accessed June 2020].

Strain, L. (2017). 10 Steps to Reducing Embodied Carbon. [online] AIA. Available at: <https://www.aia.org/articles/70446-ten-steps-to-reducing-embodied-carbon> [Accessed June 2020]

UKGBC. (2017). Embodied Carbon: Developing a Client Brief. [pdf] UKGBC. Available at: <https://www.ukgbc.org/wp-content/uploads/2017/09/UK-GBC-EC-Developing-Client-Brief.pdf> [Accessed June 2020].

Weight, D., & Rawlinson, S. (2007). Sustainability: Embodied Carbon. [online] Building. Available at: <https://www.building.co.uk/data/sustainability--embodied-carbon/3097160.article> [Accessed June 2020].

# Co-benefits: Green Space

Environmental Value	Co-Benefits (social value)	Financial Considerations	Delivery Considerations
<ul style="list-style-type: none"> <li>Climate resilience. Mitigating the Urban Heat Island Effect and heatwaves</li> <li>Water resilience. Reducing flood risk. Absorb water and capture run-off. Contributes to improved water quality and reduces stormwater run-off. Provides sustainable drainage. Releases burden on sewage systems.</li> <li>Contribution to Biodiversity Net Gain and developing urban wildlife habitats.</li> <li>Improved air quality.</li> <li>Reduction of noise pollution</li> <li>Carbon storage and sequestration</li> <li>Provision of various ecosystem services.</li> </ul>	<ul style="list-style-type: none"> <li>Enables active and healthy lifestyles: people with easy access to green space are three times as likely to be active.</li> <li>Active lifestyles reduce health risks including: obesity, cardiovascular diseases, diabetes and mental health issues.</li> <li>Children growing up in greener surroundings are 55% less likely to develop mental health issues.</li> <li>People living in proximity to green spaces have a more positive outlook on life and higher life satisfaction.</li> <li>Populations living in greener environments have lower levels of income related health inequalities.</li> <li>Businesses attract and retain more motivated staff in greener settings.</li> <li>Reduces pollution and improves air quality, supporting better health and wellbeing.</li> <li>Contributes to a unique sense of place.</li> <li>Potential for community ownership and involvement in long-term management - improves sense of belonging.</li> </ul>	<ul style="list-style-type: none"> <li>London's public parks have a gross asset value in excess of £91 billion.</li> <li>Value of recreational activities in London Parks is £926 million per year.</li> <li>GLA estimates that for every £1 invested in green space delivers £27 of environmental and social value.</li> <li>Improved health and wellbeing reduces physical and mental health costs: London's green spaces contribute to mental health savings of £370m/yr and physical health savings of £580m/yr.</li> <li>Access and views to green spaces can add up to 18% to property values. In London, for the average household, the value of proximity to parks is over £900 per year.</li> <li>Green infrastructure can lead to reduced energy bills during the summer with external green walls or facades.</li> <li>A 2008 study found that green spaces near workplaces can reduce sickness absence increasing labour productivity*.</li> <li>Early establishment of green spaces builds regeneration value.</li> <li>Reduction in disaster risk and associated insurance costs.</li> </ul>	<ul style="list-style-type: none"> <li>Connecting to existing green infrastructure and linking green spaces across the site is the most effective approach.</li> <li>Integrate green infrastructure within Local Plan and Infrastructure Development Plan.</li> <li>Bringing experts in the early stage of a green infrastructure project can save time and money. This includes biodiversity and ecology experts, hydrology and drainage experts, design consultants and landscape architects.</li> <li>Partnerships and collaborative work are key to delivering successful green infrastructure strategies. Including cooperation with organisations such as Environmental Agency.</li> <li>Community engagement to establish community-led spaces.</li> <li>Landowners managing green infrastructure can maximise benefits by adding revenue streams such as renewable energy or food production.</li> <li>Long-term management and maintenance plan and resources required.</li> </ul>

Sources:

ansGlobal. (2020). Living Wall Benefit: Biodiversity. [online] ansGlobal. Available at: <https://www.ansgroupglobal.com/living-wall/benefits/biodiversity> [Accessed June 2020].

ansGlobal. (2020). Living Wall Benefit: Structural Protection. [online] ansGlobal. Available at: <https://www.ansgroupglobal.com/living-wall/benefits/structural-protection> [Accessed June 2020].

Coleman, J. (2017). Making a Sound Economic Case for Investment in Green Infrastructure. [online] Environment Journal. Available at: <https://environmentjournal.online/articles/making-sound-economic-case-investment-green-infrastructure/> [Accessed June 2020].

GLA. (2017). Natural Capital Accounts for Public Green Space in London. [pdf] GLA. Available at: [https://www.london.gov.uk/sites/default/files/11015viv\\_natural\\_capital\\_account\\_for\\_london\\_v7\\_full\\_vis.pdf](https://www.london.gov.uk/sites/default/files/11015viv_natural_capital_account_for_london_v7_full_vis.pdf) [Accessed June 2020].

Green Infrastructure Task Force. (2020). Natural Capital: Investing in a Green Infrastructure for a Future London. [pdf] GLA. Available at: <https://www.london.gov.uk/sites/default/files/gitaskforcereport.hyperlink.pdf> [Accessed June 2020].

Natural Economic Northwest. (2008). The Economic Value of Green Infrastructure. [pdf] Natural Economic Northwest. Available at: [http://www.greeninfrastructurenw.co.uk/resources/The\\_Economic\\_Value\\_of\\_Green\\_Infrastructure.pdf](http://www.greeninfrastructurenw.co.uk/resources/The_Economic_Value_of_Green_Infrastructure.pdf) [Accessed June 2020].

NHS Forest. (2020). Evidence of Benefits. [online] NHS Forest. Available at: <https://nhsforest.org/evidence-benefits> [Accessed June 2020].

UKGBC. (2015). Practical How to Guide: Developing and Implementing a Green Infrastructure Strategy. [pdf] UKGBC. Available at: <https://www.ukgbc.org/sites/default/files/How%20to%20Develop%20a%20green%20infrastructure%20strategy.pdf> [Accessed June 2020].

Tensile Design and Construct. (2020). Measuring the ROI for Green Infrastructure Projects. [online] Tensile Design and Construct. Available at: <https://www.tensile.com.au/measuring-the-roi-for-green-infrastructure-projects/> [Accessed June 2020].

Wolf, K. (2017). The Health Benefits of Small Parks and Green Spaces. [online] NRPA. Available at: <https://www.nrpa.org/parks-recreation-magazine/2017/april/the-health-benefits-of-small-parks-and-green-spaces/> [Accessed June 2020].

# Co-benefits: Biodiversity

Environmental Value	Co-Benefits (social value)	Financial Considerations	Delivery Considerations
<ul style="list-style-type: none"> <li>Maintaining ecosystem services that regulate and maintain environment. Biological diversity contributes to ecosystem function, stability and resilience.</li> <li>Maintaining genetic library, preserve and regenerate soil, fix nitrogen, assimilate waste, pollinate crops, operate the hydrological cycle and sequester carbon.</li> <li>Protection of water resources, soils formation and protection, nutrient storage and recycling, pollution breakdown and absorption, contribution to climate stability, recovery from unpredictable events.</li> <li>Creating soil and maintaining high soil quality. For example: Worms aerate and condition soil and providing nutrients from their castings or waste.</li> <li>Bees, birds bats and butterflies all play a vital role in spreading pollen and dispersing seeds.</li> <li>Bacteria and fungi degrade organic material, which then further breaks down in the soil, where plants can use the nutrients.</li> </ul>	<ul style="list-style-type: none"> <li>Provision of services such as food, fibre and energy. We depend on biodiversity for biological resources such as food, medicine, wood products, ornamental plants, breeding stocks.</li> <li>Biodiverse communities are more productive, resilient and able to respond to change.</li> <li>Contributes to food security and food resilience. Larger number of plant species means a greater variety of crops.</li> <li>Biodiversity provides social benefits such as research, education, recreation and tourism and cultural values. Can promote eco-tourism.</li> <li>Educational benefits and increased awareness of nature and eco-systems.</li> <li>Biodiversity can also contribute to community engagement and participation in management of spaces.</li> <li>Contributes to cultural services such as recreation in and spiritual use of nature.</li> <li>Biodiversity loss leads to an increase in the spread of disease. Researchers speculate this is because some species are better at buffering disease transmission (including Covid-19).</li> </ul>	<ul style="list-style-type: none"> <li>The richer the diversity of life, the greater the opportunity for economic development, medical discoveries, and productive landscapes</li> <li>Biodiversity delivers ecosystem services that we have taken for free up until now. If biodiversity no longer providing these services increased socio-economic and environmental costs will be incurred.</li> <li>Approximately 75% (by weight) of the 100,000 chemicals released into the environment can be degraded by biological organisms. Biological remediation of chemical pollution worldwide saved \$106bn (1997 calculation) when compared to alternative techniques.</li> <li>Pollinators provide significant benefits to agricultural and natural ecosystems, including adding diversity and productivity to food crops. As many as one third of the world's food production relies on insect pollination.</li> <li>Investments in protected areas generates a cost-benefit ratio of 1:25 and even 1:100 in some cases</li> <li>Bio-mimicry in engineering can promote innovation and reduce operational costs.</li> </ul>	<ul style="list-style-type: none"> <li>Early Preliminary Ecology Appraisal required to assess baseline condition.</li> <li>Site-wide biodiversity and ecology strategy required to set out road map for BNG across the development.</li> <li>Implement nature-based solutions and invest in blue and green infrastructure.</li> <li>Setting shadow prices for ecosystem services provided by nature.</li> <li>Promote the use of native species and carefully monitor invasive species.</li> <li>Promoting wilderness in residential gardens and re-wilding where possible and appropriate.</li> <li>Bee box on bus stops and other micro biodiversity hot spots.</li> </ul>

Sources:

ansGlobal. (2018). The Importance of Biodiversity in Urban Areas. [online] ansGlobal. Available at: <https://www.ansgroupglobal.com/news/importance-biodiversity-urban-areas> [Accessed June 2020].

Argent, G. (2018). What are the Benefits of Biodiversity? [online] Sciencing. Available at: <https://sciencing.com/list-6177330-benefits-biodiversity-.html> [June 2020]

Brickhill, S. (2015). Science for Environment Policy: In-Depth Report: Ecosystem Services and Biodiversity. [pdf] European Commission. Available at: [https://ec.europa.eu/environment/integration/research/newsalert/pdf/ecosystem\\_services\\_biodiversity\\_IR11\\_en.pdf](https://ec.europa.eu/environment/integration/research/newsalert/pdf/ecosystem_services_biodiversity_IR11_en.pdf) [Accessed June 2020].

Dasgupta, P. (2020). The Dasgupta Review: Independent Review on the Economics of Biodiversity Interim Report. [pdf] HM Treasury. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/882222/The\\_Economics\\_of\\_Biodiversity\\_The\\_Dasgupta\\_Review\\_Interim\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/882222/The_Economics_of_Biodiversity_The_Dasgupta_Review_Interim_Report.pdf) [Accessed June 2020].

Dhote, M., & Mukherjee, D. (2018). Co-Benefits of Urban Biodiversity. [online] Springer. Available at: [https://link.springer.com/chapter/10.1007/978-981-10-5816-5\\_9](https://link.springer.com/chapter/10.1007/978-981-10-5816-5_9) [Accessed June 2020].

Greentumble. (2016). 5 Factors that Help to Increase Biodiversity. [online] Greentumble. Available at: <https://greentumble.com/5-factors-that-help-to-increase-biodiversity/> [Accessed June 2020].

IUCN. (2019). Nature-based Solutions and Protected Areas to Improve Urban Biodiversity and Health. [online] IUCN. Available at: <https://www.iucn.org/news/europe/201907/nature-based-solutions-and-protected-areas-improve-urban-biodiversity-and-health> [Accessed June 2020].

Mace, G., Norris, K., & Fitter, A. (2012). Biodiversity and Ecosystem Services: A Multilayered Relationship. [online] ScienceDirect. Available at: <https://doi.org/10.1016/j.tree.2011.08.006> [Accessed June 2020].

## Co-benefits: zero waste

Environmental Value	Co-Benefits (social value)	Financial Considerations	Delivery Considerations
<ul style="list-style-type: none"> <li>Reduction in carbon emissions associated with waste including emissions from food waste.</li> <li>Reduction in pollution caused by waste collection and waste disposal</li> <li>Reduces risks of pollution incidents and contamination. Including reduction in plastic pollution and other packaging pollution.</li> <li>Reduces the use of virgin materials.</li> </ul>	<ul style="list-style-type: none"> <li>A waste-free environment contributes to place value and helps generate community pride and ownership.</li> <li>Sharing and re-use networks can help residents save money and can also strengthen community spirit.</li> <li>Improved health and well-being from reduction in pollution and changes in lifestyles. For example, studies have found that individuals aiming to create zero waste tend to have cleaner and environment-friendly eating habits. This results in health and well-being improvements.</li> <li>Increases reputational value</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in costs resulting from fly-tipping.</li> <li>Promotes a more efficient use of resources which can lead to cost-savings.</li> <li>Eliminates landfill expenses and waste disposal costs.</li> <li>Contributes to the creation of local jobs. Ten times more jobs are created through reducing, reusing and recycling than through refuse disposal.</li> <li>New business opportunities in recovery, reprocessing and recycling for the local economy.</li> <li>In high density development waste management can result in higher service charges which can impact affordability.</li> </ul>	<ul style="list-style-type: none"> <li>Circular economy statement required.</li> <li>Focus on early establishment of innovative waste strategy.</li> <li>Conduct pre-demolition audit. The earlier the audit is performed the more materials and resources can be recovered and reused.</li> <li>Requires spatial planning to allow better segregation of waste and circular waste processes.</li> <li>Produce management and maintenance plan for resources</li> <li>Encouraging the sharing economy and community initiatives.</li> <li>Circular and zero waste approaches can simplify design of buildings and accelerate delivery.</li> </ul>

### Sources:

Collins, S. (2016). Recycling: The Business Case. [online] Regeneration in Action. Available at: <https://zerowastezone.blogspot.com/2016/12/recycling-business-case.html> [Accessed June 2020].

DEFRA Waste Economics Team. (2011). The Economics of Waste and Waste Policy. [pdf] DEFRA. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69500/pb13548-economic-principles-wr110613.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69500/pb13548-economic-principles-wr110613.pdf) [Accessed June 2020].

Gunther, M. (2014). How the Zero Waste Economy Benefits Everyone. [online] GreenBiz. Available at: <https://www.greenbiz.com/article/how-zero-waste-economy-benefits-everyone> [Accessed June 2020].

Leblanc, R. (2019). Zero Waste, Zero Landfill and Role for Recycling. [online] Small Business. Available at: <https://www.thebalancesmb.com/zero-waste-zero-landfill-and-role-for-recycling-2878097> [Accessed June 2020].

OECD. (2018). Re-Circle: Business Models for the Circular Economy. [pdf] OECD. Available at: <https://www.oecd.org/environment/waste/policy-highlights-business-models-for-the-circular-economy.pdf> [Accessed June 2020].



## Co-benefits: local production

Environmental Value	Co-Benefits (social value)	Financial Considerations	Delivery Considerations
<ul style="list-style-type: none"> <li>Local production helps to eliminate the waste of products made to adhere to overseas minimums, reduce emissions and energy usage</li> <li>Reduction in waste during shipment including excessive packaging and labels aligned with multi-channel transportation, emissions and cost of fuel.</li> <li>Buying local can reduce the use of plastic and packaging.</li> <li>Reduction in environmental externalities associated with producing goods internationally.</li> </ul>	<ul style="list-style-type: none"> <li>Support realisation of place making pillar ‘Your place to make and create’.</li> <li>Build on the site’s existing production and industry to create new training and employment opportunities.</li> <li>Supports local making, production and agriculture.</li> <li>Contributes to a unique identity and sense of place that builds community value.</li> <li>Can support more productive and efficient use of space and resources.</li> <li>Promotes better working conditions for employees and better health and safety.</li> <li>Generation of high-quality products.</li> <li>Local and seasonal food can support improved health: more nutrient density, better diets, fruits and vegetables that were grown in their native nutrient dense soils are rich in probiotics and support gut health and immune response.</li> <li>Buying local can lessen risks of food contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Reduced transportation costs.</li> <li>Local production means you can have low minimums. Businesses can grow gradually, is exposed to less business risks, and there is no need to hold a lot of inventory in warehouses. This generates cost savings.</li> <li>Manufacturing locally increases the quality of service and dealing with smaller quantities of product allows adaptability. This can increase profitability.</li> </ul>	<ul style="list-style-type: none"> <li>Procurement throughout delivery process should favour and encourage local production.</li> <li>Support and assist local supply chains. There needs to be strong engagement with supply chain.</li> <li>Provide incentives and support local stores and shops. This should potentially be council-led. It can include creating spaces for local makers and enabling innovations with innovation hubs.</li> <li>Promote local food production and allocate sufficient space for local food production.</li> </ul>

Sources:

Barnes, A. (2018). The Benefits of Manufacturing Locally. [online] ExpertHub. Available at: <https://www.expertHub.info/launch/starting-a-business/types-of-businesses-to-start/the-benefits-of-manufacturing-locally/> [Accessed June 2020].

Castle, L. (2018). 10 Advantages of Buying Local. [online] Well. Available at: <https://www.well.org/conscious-consumers/10-advantages-of-buying-local/> [Accessed June 2020].

Fogle, K. (2018). How Suppliers Can Leverage the Benefits of Local Sourcing for Manufacturers. [online] Weidert. Available at: <https://www.weidert.com/blog/leverage-local-sourcing> [Accessed June 2020].

Martell, M. (2014). 5 Advantages of Keeping Production Local. [online] Maker’s Row. Available at: <https://makersrow.com/blog/2014/06/5-advantages-to-keeping-production-local/> [Accessed June 2020].

Pant, H. (2018). What are the Benefits of Local Production? [online] Mochini. Available at: <https://www.mochini.com/what-are-the-benefits-of-local-production/> [Accessed June 2020].

Recrosio, E. (2016). 4 Big Reasons to Manufacture in a Local Factory. [online] Sculpteo. Available at: <https://www.sculpteo.com/blog/2016/10/25/4-big-reasons-to-manufacture-in-a-local-factory/> [Accessed June 2020].

Rogers, J. (2016). Why Making Things Locally is the Key to Sustainable Manufacturing. [online] GE. Available at: <https://www.ge.com/news/reports/jay-rogers-why-local-manufacturing-is-the-key-to-sustainable-manufacturing> [Accessed June 2020].

# Co-benefits: circular materials

Environmental Value	Co-Benefits (social value)	Financial Considerations	Delivery Considerations
<ul style="list-style-type: none"> <li>Reduction of carbon emissions associated with production and consumption of materials.</li> <li>Reduction in use of virgin and high carbon materials.</li> <li>Reduction in dependence on importation of raw materials.</li> <li>Less waste and less pollution including avoidance of environmental damage caused by excessive resource extraction.</li> <li>Less pollution entering earth's life support systems.</li> </ul>	<ul style="list-style-type: none"> <li>Circular economy helps address labour market skills gaps and regional unemployment</li> <li>Cost-savings for consumers who can use products longer or repair them for a cheaper price (compared to replacing).</li> <li>Improved consumer satisfaction: market studies have shown that consumers want more repairable products; qualitative research for the UK's Department for Environment Food and Rural Affairs shows that consumers are "annoyed" when devices don't last as long as expected, and they found that getting devices repaired was "too difficult."</li> <li>Consumers will also be provided with more durable and innovative products that will increase the quality of life and save them money in the long term.</li> <li>Sharing economy can help create stronger community bonds and community spirit.</li> </ul>	<ul style="list-style-type: none"> <li>Increases economic resilience.</li> <li>Creation of new green industries and jobs: the circular economy could create 205,000 new jobs in the UK across all skill levels.</li> <li>Circular economy opportunities in Europe worth between €1.5-2.5 billion</li> <li>Measures such as waste prevention, ecodesign and re-use could save EU companies €600 billion - equivalent to 8% of annual turnover - while also reducing total annual greenhouse gas emissions by 2-4%.</li> <li>Improves resource productivity: In the UK, electrical goods are worth 50% more if they are sold for reuse rather than recycling. However, only 23% are suitable for reuse and only 2% are currently reused.</li> <li>Cradle-to-cradle design could considerably reduce costs for producers and consumers alike</li> <li>Stimulation of innovation which in turn can boost economic growth</li> <li>Increase competitiveness, brand value and reputation</li> <li>Using more durable materials can reduce whole-life costs</li> <li>Reduced maintenance costs.</li> </ul>	<ul style="list-style-type: none"> <li>Incorporate entire lifecycle analysis into the design process across Meridian Water.</li> <li>Early establishment of Meridian Water Circular Innovation Hub as part of construction skills centre.</li> <li>Engage local supply chains.</li> <li>Design buildings and materials to be disassembled and reused.</li> <li>Prepare material passports to enable end of life recovery.</li> <li>Needs to be supported by good policies. Including eco-design policy to make products more reusable and more recyclable. And producer responsibility policy prioritising reuse and supporting secondary materials markets.</li> <li>Encourage the sharing economy include products as services, places to share/make/repair and redistribution markets.</li> <li>Promote digitalisation and internet of things.</li> <li>Adopting design thinking to deliver utility for consumers and companies based on products, services, and experiences that are better fit for purpose and come with a smaller end-to-end resource footprint.</li> </ul>

Sources:

Bové, A., & Swartz, S. (2016). Mapping the Benefits of a Circular Economy. [online] McKinsey Company. Available at: <https://www.mckinsey.com/business-functions/sustainability/our-insights/mapping-the-benefits-of-a-circular-economy> [Accessed June 2020].

Circular Design Guide. (2018). Material Selection. [online] Circular Design Guide. Available at: <https://www.circulardesignguide.com/post/material-selection> [Accessed June 2020].

Green Alliance. (2015). The Social Benefits of a Circular Economy: Lessons from the UK. [pdf] Green Alliance Available at: <https://www.green-alliance.org.uk/resources/The%20social%20benefits%20of%20a%20circular%20economy.pdf> [Accessed June 2020].

Sakao, T., & Webster, K. (2020). In a Circular Economy, Product as a Service has Social and Environmental Benefits. [online] GreenBiz. Available at: <https://www.greenbiz.com/article/circular-economy-product-service-has-social-and-environmental-benefits> [Accessed June 2020].

TechRadar Pro. (2018). The Well-Rounded Benefits of the Circular Economy. [online] TechRadar. Available at: <https://www.techradar.com/news/the-well-rounded-benefits-of-the-circular-economy> [Accessed June 2020].

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## **Implementing the Vision**

This section describes the process required to turn the vision, objectives and requirements into a successful implementation plan.

# Implementation Principles

Meridian Water has set an ambitious vision to be among the greenest developments in London and at the forefront of sustainable development worldwide. Setting the vision, objectives and requirements is just the first part in the process of embedding sustainability goals and targets throughout the overall development and individual delivery projects. This section describes the process required to turn the vision, objectives and requirements, that were outlined in the first part of this document, into a successful implementation plan.

The Environmental Sustainability Strategy sits alongside and should be read in conjunction with the Implementation Action Plan and Implementation Programme.

## Implementation Action Plan

The Implementation Action Plan sets out what is needed to deliver the Environmental Sustainability Strategy, including integrating it with the economic and social strategies, developing theme specific strategies, and formalising an approach for embedding the sustainability vision, objectives and requirements across the whole development.

## Implementation Programme

The Implementation Programme describes the project management process which will be adopted to deliver the sustainability vision, objectives and requirements.

Sustainability is often treated as a 'nice to have' and is seen as incurring additional cost. Therefore, many developments write a vision, but fail to fully implement it. Whereas getting sustainability fully embedded in the processes rarely costs more, adding it as an after thought ensures it is considerably more expensive.

There are four characteristics, or principles, that distinguish developments that are successful at implementing sustainability:



Key ingredients for fully embedding sustainability into the implementation process

## Good Governance

Governance and leadership that recognises and champions sustainability alongside other key deliverables (programme, budgets, health and safety).

## Culture Shift

A supportive and collaborative culture that embraces sustainability, starting at the top of an organisation and flowing through all levels of the development team, from client to development partners and eventually into behaviours and actions of residents.

## Enabling Innovation

An enabling and innovative approach to development that promotes and invests in the adoption of new ideas and solutions, through effective supply chain engagement and sharing of risk and reward.

## Capturing Value

An approach that moves beyond traditional cost models and is built on whole life value including financial, social and environmental value - a triple bottom line approach.

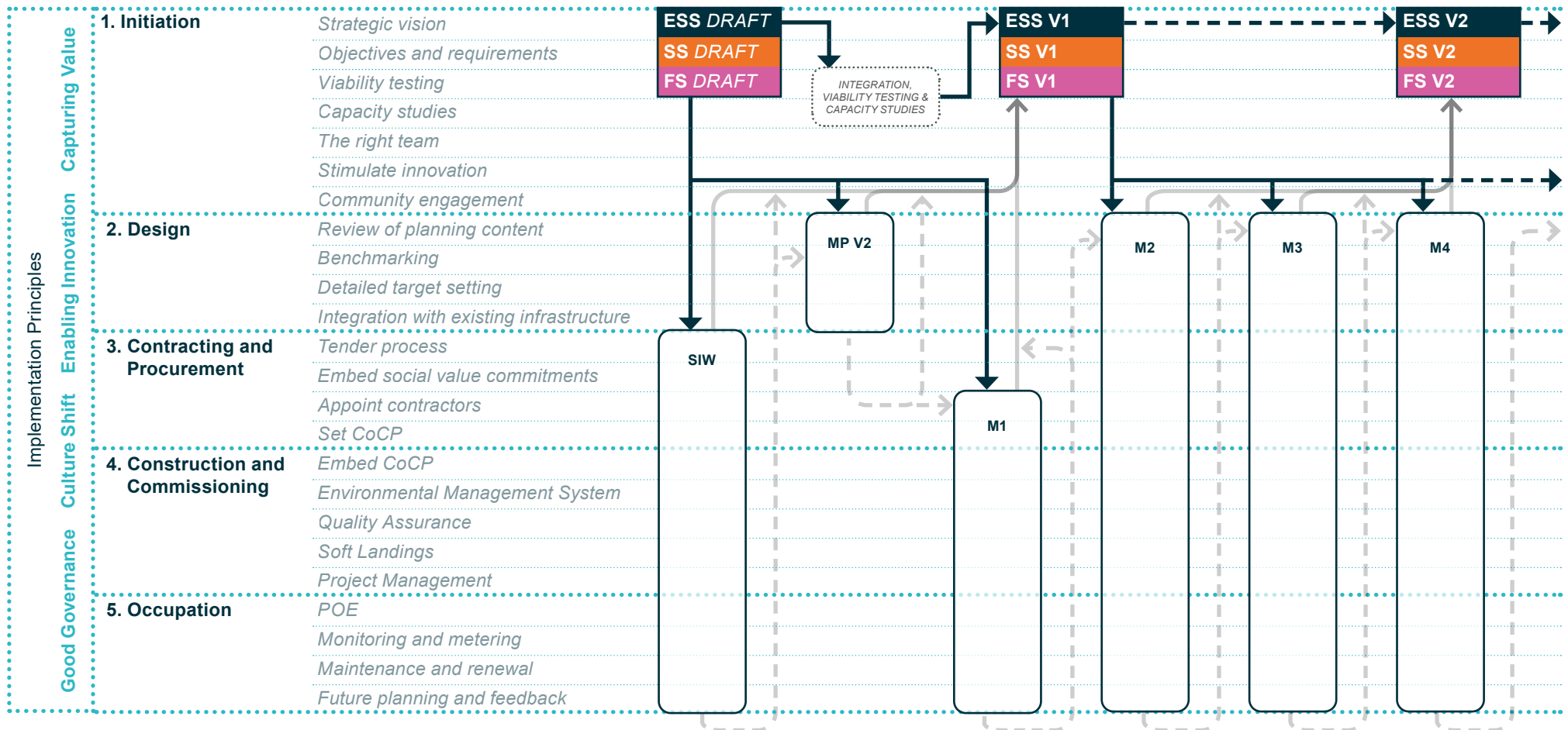
# Implementation Process

## Five steps for sustainable development

This Environmental Sustainability Strategy sets out an ambitious vision, with supporting objectives and requirements. These reflect current policy, particularly the draft London Plan, as well as the Government's and Enfield Council's ambitions, all of which are aimed at tackling the climate and biodiversity crisis and addressing social exclusion.

All of the objectives and requirements can be met; however, this will require the delivery team and development partners to adopt best practice approaches and, in some cases, explore innovative delivery models. Sustainability is fragile and can breakdown at any stage. An implementation strategy needs to safeguard sustainable thinking across all stages of the development life cycle from initiation to occupation.

The diagram below provides an overview of the implementation process. The following pages describe each of the five steps in more detail. These steps relate to the whole development management and delivery process, including preparation of business cases and building a viable brief, as well as infrastructure and civil engineering works that do not follow the RIBA procurement stages.





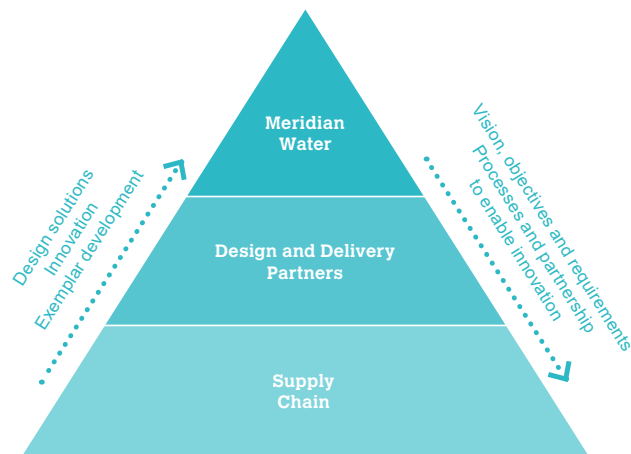
# Step 1: Initiation (planning, brief and viability)

## Effective governance for innovation

At the very inception of a development, governance approaches and delivery structures and systems need to be agreed, stakeholders engaged and roles and responsibilities established, as business plans and financial strategies are developed and tested.

Building the wider social and environmental vision and objectives, as well as overall placemaking aims, into the development management framework at the outset ensures that the ground is laid for these issues to be fully integrated into briefs and projects.

Great projects and innovation start with great clients. As a very large, multi-phase project, Meridian Water has the potential to stimulate the market, by establishing an environmental innovation programme, based on the following themes: zero carbon buildings, biodiversity net gain, multi-utility infrastructure companies, decarbonising materials, a clean energy grid, circular economy in construction and off-site local manufacturing, a circular economy and clean tech hub, new business models and a future transport programme.



Innovation process relies on strong leadership and early supply chain engagement

## Capturing the true value of development

A triple bottom line approach to cost and value assessment is required to evaluate the contribution that sustainability requirements make to placemaking, and social and environmental value, over the long term. It is important that the finance, legal and procurement teams are fully engaged and on board with the whole life value approach, and that they work closely with the sustainability facilitator in a collaborative and transparent way.

Community engagement needs to start at the inception stage, so that local people are fully involved, in the development of their new neighbourhood. Community engagement is most effective when it is an ongoing cumulative process enabling relationships and trust to build and strengthen over time.

## Initiation: Key Actions

**Strategic vision:** Develop and build consensus around a holistic place vision, defining the sort of development that will be delivered.

**Objectives and requirements:** Agree social and environmental objectives and requirements that the development will achieve

**Stimulate innovation:** Delivery team and project managers to access and stimulate the market by setting the right incentives, bringing together the right partners, and inviting industry to respond creatively and generate the interest and support for the scheme.

**The right team:** Put in place effective governance structures and a high performing team, with consistent and strong leadership. Establish clear roles and responsibilities for all relevant stakeholders.

**Viability testing:** Evaluate the economic viability of the proposed development, considering gross development value, costs, land value, landowner premium, and developer return.

**Capacity studies:** Agree social infrastructure provision, affordable and family home numbers and split, and overall densities.

**Community engagement:** Initiate conversations with local people to develop a clear understanding of development needs and to put in place transparent and collaborative processes from the outset.

## Step 2: Design (feasibility, concept and detailed design and engineering)

### Testing and tailoring the Strategy

During the design phase the vision, objectives and requirements are embedded and integrated throughout Meridian Water. To deliver the vision, the team need to fully understand what the targets are, and the design process needs to allow sufficient time for testing, innovation and iterative design development. This process should be subject to constructively critical design reviews, from both a technical and financial perspective.

Throughout this phase the requirements and targets should be tested on each part of the development, both in terms of technical feasibility and economic viability before agreement about the short, medium and long-term targets is finalised. They should also be tested with local stakeholders through an inclusive community engagement process that includes reviewing and commenting on designs as part of the planning process.

A project specific brief (PSB) should be set for each development parcel, and any flagship / high profile buildings. This should set out relevant objectives and requirements, but allow sufficient flexibility for design teams to develop creative and innovative strategies and approaches to meet the requirements. Design teams should then be required to demonstrate how their designs meet the Environmental Sustainability Strategy and PSB.

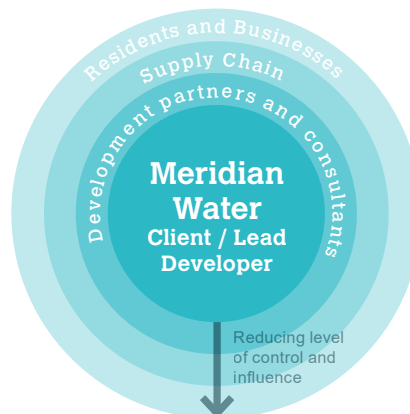
### Rigorous project management

It is important that the project management team understands and supports the vision, objectives, requirements and implementation process (the principle of a supportive culture), and that the project management systems include the environmental and social sustainability goals. The financial team also needs to be on board and there should be close and collaborative working between the sustainability facilitator and wider teams. In addition, a culture of innovation and a willingness to test new thinking and ideas is critical at this stage.

It is likely that the team will need to consider alternative delivery models to avoid 'greenwashing' and prevent delivery partners slipping back into a business as usual approach. At this point, further engagement with contractors and the supply chain should take place, including through participation in design reviews, to bring forward innovations in construction practices, such as Modern Methods of Construction, prefabrication etc.

### Spheres of influence

The Environmental Sustainability Strategy sets out objectives and requirements that can be applied to developments on land that Meridian Water owns or controls. In addition, there is an opportunity to work with Enfield Council to establish policies and standards for inclusion in the Local plan, to raise the sustainability ambition and performance of all development in the Borough. Coordination will also be required with neighbouring landowners, including around transportation, flooding, green infrastructure and any wider environmental issues. These different spheres of influence should be considered when implementing the sustainability strategy, recognising there are things Meridian Water has direct control over (e.g. design briefs, procurement), and things we can only influence (e.g. behaviour of residents).



Spheres of influence

## Design: Key Actions

**Review of planning context:** including national, regional (London) and local including anticipating any future changes to policies that may impact on the evolution of objectives and requirements, including performance standards or delivery approaches.

**Benchmarking:** having set the vision to be one of the greenest developments in London, define what this means by understanding where the market is currently, what best practice looks like and how technology in sustainable development is evolving.

**Detailed target setting:** Set specific objectives and requirements for each development parcel or project, using planning reviews and benchmarks (national and international). Initially these are not fixed; instead, they are the starting point for the creative and innovative design of different elements of the development.

**Integration with existing infrastructure:** Set tailored briefs and ensure careful design of interfaces between the development and wider infrastructure.

## Step 3: Contracting and procurement

### Risk-taking and risk-sharing

Getting the right legal and contracting arrangements in place before construction begins is critical, as often this is the last chance to embed sustainability requirements, before the contractor and supply chain take over the delivery of a development.

There are many forms of contracting and legal agreement. Some put all the risk and onus on the developer/contractor, others place more risk on the client. Some encourage a claim culture whilst others enable very little room for manoeuvre. Sustainability tends to work best where contracts are performance based, where they encourage risk taking and innovation and where costs and savings are shared between client and contractor/developer on an open book basis. It is therefore important that the finance, legal and procurement teams are fully engaged and work closely with the sustainability team to take a value creation approach to procurement.

### Procuring sustainability

Tender briefs and responses should include clear commitments to social value creation, including provision of quality jobs for local and unemployed people, including specific targets for BAME representation, working with social enterprises, setting up apprentice opportunities and supporting local communities through education and skills training. Tenders should also include the highest environmental requirements, including an ISO 14001 project management system, and best practice certification and accreditation processes (e.g. BREEAM, FORS, Considerate Constructors etc.).

All social and environmental commitments should then be incorporated into procurement contracts, with appropriate incentives included to encourage innovation and best practice. Tenderers should also be invited to propose how they will carry out meaningful community engagement

around the social and environmental agendas of the development. Innovative procurement models, including performance contracting, should be explored.

In addition, a tailored Code of Construction Practice should be developed, setting out the standards and procedures to which developers and contractors must adhere to when undertaking construction at the development sites.

## Procurement: Key Actions

**Tender process:** Put in place the right construction team by selecting delivery partners who share Meridian Water's commitment and vision for sustainable development. This can be supported by placing a higher weighting on sustainability in the tender scoring process.

**Embed social value commitments:** Ensure requirements for social value creation through the construction process are embedded in tender briefs and procurement contracts, providing incentives where appropriate.

**Appoint contractors:** Incentivise best practice and innovation in construction techniques through use of forms of contract that allow contractors to share in risk and reward.

**Set Code of Construction Practice (CoCP):** Ensure all contractors sign up to the CoCP, which will form the basis for monitoring, controlling and managing construction impacts and ensure compliance with sustainability requirements.

## Step 4: Construction and commissioning

### Leadership and supply chain management

Contractors and their supply chain are crucial to ensuring that best practice in sustainability is achieved. Most of the innovation in new products, construction processes and systems comes from the supply chain (see diagram on p.53). The supply chain responds best to clear and well-defined briefs. Having engaged the supply chain early and challenged them to bring their best ideas to the development, the challenge now is to ensure these innovations are embedded and delivered.

Here, the CoCP is a useful tool in holding construction teams accountable for delivery of all aspects of the sustainability strategy. While the Development Director should be responsible for meeting the requirements directly, this will only be achieved with support from a named head of environment within the construction team.

Leadership by the Development Director and a sense of partnership based around shared values is crucial as, they are responsible for setting the culture throughout the construction phase and among the whole supply chain. Getting this right from the get-go is therefore essential. Project Directors are often very risk averse, so steps should be taken to address this, through allowing sufficient time in individual project programmes for viability testing and feasibility studies, as well as pilot projects to test out innovations.

The requirements of this strategy will not be met if a 'business as usual' approach to construction is taken. Innovative materials and fabrication methods will need to be used; this relies on appointing and managing construction teams with the right attitude, as well as experience of low carbon construction techniques.

### Optimising performance in use

There is a known performance gap between design and actual environmental performance of buildings, resulting in greater than necessary energy consumption, and reduced comfort and satisfaction for occupants.

An effective commissioning and handover process, in line with Soft Landings, is essential, to reduce the performance gap and deliver better project outcomes. This means being clear from the outset what information is required for commissioning, handover, facilities management including maintenance, and to meet any requirements of Building Information Modelling (BIM). It is also important that procurement models allow for greater involvement with, and maintain a consistent 'golden thread' between, design teams and contractors during handover and beyond.

## Construction: Key Actions

### Embed Code of Construction Practice

**(CoCP):** Carry out regular monitoring and audit against commitments set out in the CoCP, so that expectations for the way the contractor will operate are met, including around social, environmental and transport requirements.

### Environmental Management System (EMS):

Contractors to set up and operate a rigorous Environmental Management System, to meet the CoCP requirements, including minimising how its operations affect the environment and comply with all performance standards, policies and regulations.

**Quality Assurance:** Embed and follow a rigorous quality assurance process, e.g. ISO 9000 and 14001, to ensure quality standards are met and errors avoided, throughout all levels of the supply chain.

**Soft Landings:** Follow the Soft Landings process during construction, commissioning and handover, to minimise the energy performance gap and deliver buildings and infrastructure which is usable, maintainable and energy and resource efficient.

**Project Management:** Establish a management, reporting and audit process and provide regular updates on performance against the requirements of this strategy, the CoCP and any other contractual requirements.

## Step 5: Occupation (maintenance, renewal, end-of life planning)

### Evaluation and feedback

It is important to continue to monitor and report against the Environmental Sustainability Strategy objectives as areas of the development moves into the occupation stage. As part of Soft Landings, management and maintenance teams should have been engaged from the outset, and will therefore have had an input into design and construction to ensure installed systems and infrastructure are usable and easy to maintain.

Monitoring and metering systems should also have been designed early in the process, and tested and commissioned with direct input from operations, facilities and management teams, ideally before people start to move in. Any outstanding monitoring equipment should be installed as soon as possible, so that data are captured from day one.

Once occupied, regular qualitative and quantitative assessments should be undertaken to ensure snags and other issues are identified and addressed during the warranty period, as well as to ensure the design works for residents, visitors and management and operational staff. Lessons should be fed back to the developer and, where possible, alterations made. All learning should be published and shared with future phases through the Post Occupancy Evaluation process.

Engagement with the local community, including new occupants and neighbours should continue at this stage - to support and enable the formation of strong community ties, as well as putting in place any additional enabling structures required to make it easy and desirable to live and work in sustainable ways.

### Long term stewardship

Research has shown that up to 25% of materials slated for decommissioning or deconstruction from buildings can be reused. At Meridian Water, the the opportunity to disassemble and reuse material should be much higher, as contractors will have been asked to design and construct in ways that enable easy and effective reuse, from the outset. Systems should be put in place for long term stewardship of Meridian Water, including planning for refurbishment, renewal and eventual deconstruction of buildings and infrastructure systems.

As part of a whole life approach to development, the value of these materials should be captured in business models. While this is an area of innovation that is new and rapidly evolving, steps should be taken at the earliest stages to plan for eventual decommissioning in line with circular economy principles, for example by integrating asset tagging and material passports into the federated model.

## Occupation: Key Actions

**Post Occupancy Evaluation (POE):** carry out systematic POE of buildings in occupation to understand their performance and embed learning into subsequent phases of the development through continuous feedback.

**Monitoring and metering:** Monitoring and metering of environmental variables, including water, energy and waste is required as part of POE and EMS systems.

**Maintenance and renewal:** Continue to follow best practice environmental management approaches based on whole life thinking, as parts of the development require maintenance, repair and refurbishment.

**Future planning and feedback:** Publish the findings of POE to inform future planning at Meridian Water and beyond.



While taking this approach, it is likely that the need for projects and initiatives which fall outside the overall scope of the development, but which are required to meet the sustainability vision, objectives and requirements, will emerge. These projects will provide the strategic infrastructure within which sustainable development can take place. The need for these projects will emerge in parallel to the development process, and should be informed by local needs assessments and feasibility studies. Examples of strategic infrastructure projects that could enable sustainability to be fully embedded at Meridian Water include:

- **Zero emission energy network:** Development of a zero-emission power network including local renewable energy generation, storage, distribution and supply, linked to smart systems that support demand side responses, including smart metering solutions and the internet of things. These decentralised systems are sometimes known as Virtual Power Plants (VPP) and could connect to an electric vehicle charging network.
- **Smart digital systems:** This could include development of a 5G network and smart management platform to unlock the potential of open data to enable optimisation of resources and environmental monitoring.
- **Integrated water infrastructure:** Using latest smart water management technology to mitigate flooding and harvest rainwater in a land and material efficient way.
- **Waste and logistics hub:** Develop a holistic waste collection and treatment strategy, which could include underground, pneumatic or other waste systems, and link to construction and commercial waste collection and material recovery facilities. The benefit of such systems is an improvement in recycling rates, reduction in pressure on land take within development plots and the public realm, and reduced costs and impacts of waste collection.

## Delivering the infrastructure

These projects mostly fall under the general area of infrastructure (alongside innovation like soil remediation, demolition reuse and recycling etc.). They challenge conventional approaches to infrastructure delivery which tends to focus on linear supply models using traditional DNO providers to connect the project into central provision of utilities.

The sustainability approach outlined in this document adopts a different and more holistic strategy, in which supply and demand are linked as a system, which seeks to minimise use of resources, decentralise supply where possible and develop systems that use renewable and minimise resources depletion. To do this often requires different assumptions, different approaches to risk, different business models and different delivery strategies.

Briefs for these projects should be co-developed by the sustainability facilitator with the Director of Development (infrastructure and utilities). Options could include creation of Energy Services Companies (ESCOs) or multi-utility services companies (MUSCOs), making use of Independent Distribution Network Operators (IDNOs) and other innovative and hybrid partnership models.

As projects are defined they should go through a project inception process including:

- Scope development
- Options appraisal and preferred option selection
- Technical design
- Cost plan and financial appraisal
- Funding strategy
- Delivery plan
- Operational and management plan

As development progresses, it will be important to update policies and set out requirements for developers so that specific neighbourhoods and individual buildings are designed with interfaces that are compatible with present and future infrastructure provision.

# Embedding Sustainability in Delivery of Specific Projects

The 5 steps of the implementation process are applicable across the entire Meridian Water development. As individual development parcels and buildings are designed and procured there are a number of actions which will need to take place at an individual project level to ensure that the sustainability vision is delivered, and associated objectives and requirements are met.

The diagram below summarises the key steps to be taken on individual projects, based on the RIBA Plan of Work stages.

Success will rely on strong project management processes including design briefs, design review, procurement and engagement, risk and change management, oversight, audit and monitoring, sign off and approvals at each stage of the programme.

Stage 0 Strategic Definition	Stage 1 Preparation and Briefing	Stage 2 Concept Design	Stage 3 Spatial Coordination	Stage 4 Technical Design	Stage 5 Manufacturing and Construction	Stage 6 Handover	Stage 7 Use
<p>Define project environmental sustainability vision, objectives and requirements in line with site-wide and typology ESS</p>	<p>Project specific environmental sustainability brief</p> <p>Conduct feasibility studies to determine the best way of achieving objectives and requirements</p> <p>Evaluate options based on whole of life value and performance against project objectives</p> <p>Embed ESS into project culture, delivery processes and reporting</p> <p>Establish process and budget for innovation</p> <p>Engage with the supply chain to identify innovation opportunities</p> <p>Record of decisions and compliance with ESS</p>	<p>Environmental, energy, whole-life and other modelling to test and appraise design options</p> <p>Demonstrate how designs meet the sustainability targets</p> <p>Include sustainability data in federated model.</p> <p>Review project to ensure on track to achieve sustainability objectives and requirements</p> <p>Record of decisions and compliance with ESS</p>	<p>Developed modelling, design studies and engineering analysis</p> <p>Test and demonstrate how designs meet the sustainability requirements</p> <p>Review and refine sustainability requirements</p> <p>Embed sustainability requirements into procurement strategy</p> <p>Include sustainability data in federated model</p> <p>Review project to ensure on track to achieve sustainability objectives and requirements</p> <p>Record of decisions and compliance with ESS</p>	<p>Detailed modelling to test and demonstrate how designs meet the sustainability requirements</p> <p>Include sustainability data in federated model</p> <p>Embed sustainability requirements into manufacturing, construction and specification information.</p> <p>Embed sustainability requirement into Tender Information.</p> <p>Review project to ensure on track to achieve sustainability objectives and requirements</p> <p>Record of decisions and compliance with ESS</p>	<p>Monitoring for certification and compliance with ESS</p> <p>Ensure a construction management strategy is put in place to deliver sustainability requirements</p> <p>Ensure that sustainability requirements are embedded within contractors' supply chain.</p> <p>Include sustainability data in federated model.</p> <p>Carry out inspections and reviews to ensure the project continues to meet sustainability objectives and targets.</p> <p>Continue to report against sustainability targets</p>	<p>Implement 'Soft Landings' to ensure smooth handover to tenants</p> <p>Carry out full and seasonal commissioning of systems</p> <p>Compile asset information for effective performance and management in accordance with design intent</p> <p>Provide a graduated handover to new homeowners and facilities managers to ensure sustainability measures are understood</p> <p>Engage with neighbourhood governance forums to help build sense of community and communicate sustainability principles</p>	<p>Provide ongoing support to ensure buildings and places perform as per the design intent and sustainability vision</p> <p>Report performance against sustainability targets and capture lessons learnt</p> <p>Carry out post occupancy evaluation</p> <p>Engage community in sustainability and placemaking programme</p> <p>Implement initiatives to support sustainable lifestyles</p> <p>Continue to monitor against full range of social and environmental performance indicators</p>

# Roles and Responsibilities

To deliver the communal objectives set in the Environmental Sustainability Strategy, clear roles, and associated responsibilities need to be set, and the remit of each role needs to be clearly defined. This will include a clear decision-making and accountability structure that is understood by all parties involved.

It is also important to put in place a communal governance framework that enables creation of the right incentives and the right 'sanctions'. The governance framework should remain flexible and adaptable as governance needs change throughout the life of the development and as projects progress.

Suggested actions and responsibilities for key roles are set out below. We anticipate that the roles and responsibilities will be refined as individuals are appointed and delivery teams formed. A next step is to map these roles and responsibilities to the Meridian Water team structure, as the delivery organogram was not available at the time of writing.

## Enfield Council

- Ensure that the local planning process supports the delivery of sustainable development at Meridian Water, in line with their Climate Action Plan and the New Local Plan and *Meridian Water Design Guide. Supplementary Planning Document*

## Meridian Water

- Demonstrate leadership for sustainability in all that we do, internally and externally
- Embed the sustainability strategy into our culture, briefs and delivery processes
- Embed sustainability reporting into our standard programme management reporting
- Communicate the sustainability strategy externally
- Provide sustainability training to our staff where required
- Engage with external partners to deliver the

sustainability strategy

- Establish processes to enable innovation to achieve the sustainability objectives
- Update the sustainability strategy over time

## Design Team

- Proactively seek opportunities to meet the sustainability targets and objectives through concept design
- Engage with the supply chain to identify innovation opportunities
- Clearly communicate how the design addresses the sustainability targets and objectives in all design reports
- Report progress against achievement of objectives and targets throughout design stages
- Identify any key risks to the achievement of sustainability objectives and proactively manage them

## Project Managers

- Manage and implement the Environmental Sustainability Strategy in collaboration with Sustainability Facilitator
- Embed sustainability objectives into Programme Board reports at key gateway stages

## Sustainability Facilitator

- Champion sustainability across the whole development and 'own' this strategy, with responsibility for its delivery.

## Cost Consultant

- Recognise that sustainable approaches do not have to cost more and can lead to cost savings
- Ensure life cycle costing approaches are used to inform design and procurement decisions
- Take a proactive approach to identifying whole of life value in opportunities

## Procurement Consultant

- Ensure that sustainability objectives are embedded

within the procurement process, working with the Sustainability Facilitator. This includes adequate weighting to sustainability (10-30%) and suitable tender questions

- Work with Sustainability Facilitator to evaluate sustainability responses
- Ensure that sustainability commitments are included in contracts

## Contractors and their Supply Chain

- Proactively seek opportunities to meet the sustainability targets and objectives through detailed design
- Clearly communicate how the design addresses the sustainability targets and objectives in all design reports
- Report progress against achievement of objectives and targets throughout design and construction stages
- Identify any key risks to the achievement of sustainability objectives and proactively manage them
- Proactively engage with the supply chain to bring forward innovation and approaches to delivering sustainability objectives
- Embed the sustainability strategy requirements into construction management plans and processes
- Ensure the development is built to highest quality standards, ensuring that construction approaches do not compromise meeting sustainability objectives
- Engage with the Meridian Water Sustainability Facilitator at the beginning of construction and at key milestones throughout the delivery process

## Landowners and development partners

Whilst outside of the immediate Meridian Water 'sphere of influence' it is expected that landowners and development partners:

- Develop plots in accordance with local planning policy and the requirements of this strategy.
- Proactively explore opportunities for partnering, risk sharing and innovation.

# Accreditation and Standards

Sustainability accreditation and performance standards are one of the tools which can support the delivery of sustainable development. The benefit of these tools is that they offer third party verification of the approaches, and as such are an independent measure of environmental performance which are well understood and recognised.

However, they are generic and include credits which are not context specific or are already covered in other policies on projects, require very little effort to achieve and add little additional value. The pursuit of certain accreditation can sometimes result in a tickbox attitude among delivery partners and prioritisation of the least challenging, lowest cost credits, as well as stifling creativity by being too prescriptive.

To address these issues Meridian Water has developed a more targeted approach that is closely aligned to the masterplan, infrastructure works and overall development objectives. A site-specific set of standards has been applied rather than adopting a 'one size fits all' approach.

The most widely used accreditation systems in the UK are BREEAM and CEEQUAL. The Environmental Sustainability Strategy has taken the most relevant

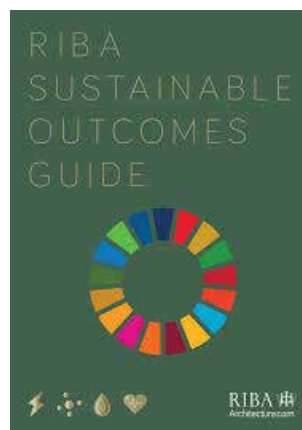
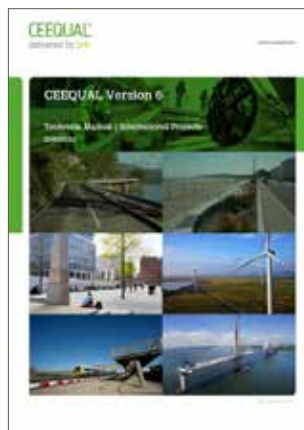
objectives from BREEAM and CEEQUAL, but rather than providing a range of targets, the strategy sets specific requirements for key objectives.

Where the Environmental Sustainability Strategy diverges from these accreditation systems is in the way it addresses stakeholder engagement and management. Meridian Water will adopt its own rigorous approaches to stakeholder engagement as part of the overall approach to Local Plan making, masterplanning and design code development. In addition, Meridian Water has set up a bespoke project management and implementation system that will ensure that the Environmental Sustainability Strategy and other objectives and targets are achieved. The strategy will have an accompanying implementation plan that will cover many of the targets and process requirements included in both BREEAM and CEEQUAL. Successful implementation of the strategy would support the achievement of BREEAM and CEEQUAL 'excellent' ratings as a minimum, with 'outstanding' being achievable.

The Environmental Sustainability Strategy has also absorbed core aspects of RIBA Sustainable Outcomes, LETI and Passivhaus and adapted them to the Meridian Water development. Other schemes such as the WELL

standards (v2 & Community) address quality criteria for human health and wellbeing during operation in much greater detail. However, given the nature of the development including building typologies, density, heights, and massing it is unlikely that the development will be able to comply with many of the goals set out in the WELL standard. The Environmental Sustainability Strategy does however set daylight, overheating and other relevant standards that will ensure the themes in the WELL standard are addressed.

In conclusion, the adoption of third party accreditation systems will provide very little if any additional benefit in term of performance, but they are widely recognized and used in the industry and therefore are a way of gaining recognition among peers and professional bodies. However, they do not have the same level of recognition among the public and potential future residents and add little in themselves to regeneration or building value that won't be achieved through the Environmental Sustainability Strategy. Further, there are costs of adopting accreditation schemes including the cost of registration and third party assessment and in additional management and administration.



## **BREEAM UK New Construction**

The Enfield Climate Action Plan requires all 'new build' non-residential buildings to achieve BREEAM 'outstanding'. If the Environmental Sustainability Strategy is rigorously applied and achieved, outstanding should be achieved. As Meridian Water is a flagship Enfield project it should adopt BREEAM for non-residential development.

## **BREEAM Infrastructure / CEEQUAL**

Meridian Water should adopt CEEQUAL on major infrastructure works as this system is well understood by major contractors and it focuses on process as well as achievement of quantifiable objectives. It provides a readymade process for monitoring and auditing progress against targets and is easy to apply. The use of CEEQUAL however should be dove tailed with the Environmental Sustainability Strategy so that the achievement of some key environmental credits are specified within CEEQUAL.

## **BREEAM Communities**

Meridian Water will gain little benefit from adopting BREEAM communities as it is commissioning a detailed masterplan and design codes which go beyond BREEAM communities and together with the Environmental Sustainability Strategy will deliver all the key outcomes. However, as a condition of the outline planning permission Meridian One must achieve BREEAM Communities 'very good' and the outline planning application for Phase 2 included a BREEAM Communities pre-assessment with an 'excellent' forecast. For these phases which are not covered by the ESS directly BREEAM communities should continue to be applied.

## **HQM, WELL and Passivhaus**

MW should not adopt BREEAM HQM, WELL Building or Passivhaus as these add little to the overall performance or value and will either add cost or will be very hard to achieve. However, the processes and testing requirements set out in Passivhaus should be reviewed and where appropriate adopted through the implementation strategy, as these have been shown to close the gap between design standards and actual performance and enhance overall build quality.



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## **Sustainable Development Precedents**

A selection of best practice case studies for sustainable development, with a focus on London precedents alongside relevant international and UK examples. Innovation and social value precedents are also included.

# London Precedents: Queen Elizabeth Olympic Park

Site area:	64 ha
No of dwellings:	10,000
Av. density:	156 dph
Public green/blue space:	25%
PTAL:	3-6
Completion:	2031

Sustainability and the environment were at the heart of London's successful bid for the 2012 Olympic and Paralympic Games. Key to the successful delivery of the greenest games ever were new standards for environmental performance and regeneration, and legal, contracting and procurement systems that promoted sustainability and innovation as part of creating a culture of collaboration, learning and partnership.

NEC contracts that took a value creation approach to development and required very high sustainability standards. Most importantly, tenders involved several engagement events in which the sustainability goals were set out and design and sustainability criteria were given a very high weighting in the procurement process (70%).

Five new distinct residential neighbourhoods are being created around the Queen Elizabeth Olympic Park that will provide 10,000 new homes. In addition to The Queen Elizabeth Olympic Park itself substantial amounts of public green space has been provided within new residential areas, with a focus on creating biodiversity rich spaces.

The regeneration project is providing employment space for 25,000 new jobs. The commercial strategy places a strong emphasis on working with existing communities to ensure they benefit from economic development, and support new and existing creative industries.



Queen Elizabeth Olympic Park, surrounded by new residential neighbourhoods Chobham Manor and East Village



# London Precedents: Elephant and Castle

Site area:	13.4 ha
No of dwellings:	5,000
Av. density:	373dph
Public green/blue space:	25%
PTAL:	6
Completion:	2025

The regeneration of Elephant and Castle is aiming to be one of the most environmentally sustainable urban regeneration projects in the world. They have focused their sustainability strategy on three key themes: climate positive, green spaces and sustainable transport.

The development will be climate positive when it completes in 2025. The area is one of ten low carbon zones identified by the Mayor of London tasked with local production of cleaner better value energy to fuel local households and businesses; CHP will deliver zero-carbon heating. New homes will be at least 35% more energy efficient than current regulations and will include 15 accredited Passivhaus homes.

Elephant Park has a commitment to create central London's new 'green heart'. Over 11 acres of new and improved public spaces will be delivered, in addition to urban greening elements.

Regeneration is designed to support and encourage sustainable transport: prioritising walking and cycling, access to public transport and electrification of vehicles.

The environmental sustainable placemaking principles are embedded in The Elephant and Castle Supplementary Planning Document, produced in 2012, which will guide the development over the next 15 years, ensuring that regeneration is coordinated and sustainable.



Elephant Park CLT construction, shared resident green and play spaces and Certified Passivhaus homes (bottom right)



# London Precedents: Woodbury Down

Site area:	52 ha
No of dwellings:	5,500
Av. density:	106 dph
Public green/blue space:	45% (12% green + 33% blue)
PTAL:	4-6
Completion:	2028

The regeneration of Woodbury Down is committed to enhancing the natural environment and has capitalised on the area's abundant wildlife and existing reservoirs to create a new urban nature reserve as well as a multitude of parks and squares. The development also promotes biodiversity through the incorporation of urban greening elements such as living roofs and natural swales as part of the SUDS.

Master planning for Woodberry Down has focused on creating a sustainable community, with large and improved public open spaces as well as new community facilities.

All new homes will be highly energy efficient. Heating and hot water is supplied through an efficient communal heating network and a CHP system. PVs on roofs supply the development with renewable energy for communal areas.

All homes have with water efficient fittings and rainwater harvesting systems are incorporated in the drainage design to reduce the need for mains water to irrigate planting across the development.

The development is designed to support and encourage sustainable transport: prioritising walking and cycling, access to public transport and electrification of vehicles.

Woodbury Down is a useful precedent for working with Thames Water, local communities and stakeholders to deliver unique and valuable green/blue infrastructure that becomes the heart of the development.



Key to the Woodbury Downs regeneration has been the creation of an urban nature reserve, the Woodbury Wetlands.



# London Precedents



## King's Cross Regeneration

The 27 ha redevelopment of industrial and railway lands adjacent to King's Cross and St. Pancras International Station aimed to create a vibrant new mixed-use city quarter.

High-quality and accessible public open spaces and public realm were delivered incrementally at key stages of the regeneration project as catalysts for place activation.

Smart technology was used to collect data on visitor footfall and activity assisting with capacity planning throughout the process.



## Agar Grove

The largest Passivhaus development in the UK, this residential scheme promotes occupant comfort and wellbeing while minimising energy use through optimisation of building fabric and massing.

Dual aspect apartments with large areas of glazing and balconies allow natural daylight and sunlight while minimising overheating.

Agar Grove demonstrates that a fabric first approach can bring great benefit to large-scale residential projects, such as Meridian Water.



## Kidbrooke Village

Previously culverted underground the River Quaggy has been restored and now runs through Sutcliffe Park as part of a nature reserve that includes wetlands, playspace, sports pitches and pedestrian/cycle routes within the Kidbrooke Village development.

Sutcliffe Park is part of a network of green spaces across the village which have supported a radical increase in biodiversity.

There is opportunity to similarly open up the waterways Meridian Water as part of creating high-quality green and blue networks.





### Goldsmith Street, Norwich

The Passivhaus certified Goldsmith Street social housing scheme designed by Mikhail Riches was awarded the RIBA Stirling Prize 2019. The scheme provided Norwich City Council with 93 low energy home and has been hailed as a transformative social housing scheme that addresses both our climate and housing crisis.

Brief formulation was important and very early on the council, the architects, the designer, and WARM LTD (a company that specialises in passivhaus design) worked together to determine the best approach. Early collaboration was key.

The project demonstrates that cost is no longer a barrier at £1875/m<sup>2</sup>, and that Meridian Water can aim for passivhaus standards. In Norwich, cost savings were made early in the design process by making significant alterations to the brickwork, roof, and foundation packages which did not affect the energy performance.



### Eddington, Cambridge

The 150ha site in north-west Cambridge is being developed by the University to provide 5,000 homes for key workers, post-graduates and private sale.

The University has made significant investment in community infrastructure and has set aside one third of the site for public open space to help people lead sustainable, active and healthy lives.

PVs are used extensively alongside a centralised energy centre and district heat network. Eddington has installed the largest underground waste system and side-wide water recycling in the UK.

All homes are designed to Code for Sustainable Homes Level 5 and all buildings achieve BREEAM Excellent.



### Riverside Sunderland

Riverside Sunderland is a major city-centre regeneration project. which supports a shift towards a low carbon economy. It will be a climate and carbon positive development which through sustainable placemaking will seek to build and retain talent within the city. The site will be designed to embrace the principles of a circular and sharing economy. In doing so, there is a commitment by Sunderland City Council (SCC) and igloo to create opportunities for local businesses and supply chains.

Riverside Sunderland is a joint venture between SCC and igloo, a developer well known for their approach to building sustainable communities. Having developed a strong communal vision for the project and shared risks, the partners are encouraging the delivery of innovative low carbon energy systems.

# International Precedents



## Hammarby Sjostad, Stockholm, Sweden

Completed in 2017 Hammarby Sjostad is mixed-use development that provides 11,000 homes. The former industrial site has been transformed into a new neighbourhood with a focus on exemplar environmental design and integrated delivery of urban systems.

The Eco-district has received international recognition for integration of several infrasystems into the masterplan from the very beginning: technical infrastructure, mobility and communication, infrastructure, building infrastructure as well as greenblue infrastructure.

Public funding was provided for the initial up front costs of developing enabling infrastructure, all of which has been fully reimbursed by subsequent development contributions.

Life cycle cost analysis was also used to inform planning decisions and help to justify the added costs of higher environmental standards.



## Bottière Chênaie, Nantes, France

This Eco-District for 5,000 inhabitants evolved over 15 years on 35 hectares of old vegetable and market-garden land.

The new district reopens Gohards Creek and 'builds the city around the river'. The creek forms the heart of the development and the collection point for the neighborhood's rainwater. 'Thin' and 'thick' parklands radiate from the creek into the streets. Rainwater is collected in the swales that run along the streets, and in basins that animate public spaces. A network of private and 'family' gardens add to the water management landscape network.

Bottière Chênaie is an example of celebrating water to create a unique sense of place.



## Vauban, Freiburg, Germany

A sustainable district of 5,500 residents, it was delivered by the local government a group of building owners.

All the houses and buildings were designed to have the lowest energy consumption possible; at least 100 meet passivhaus standards. CHP provides heating where required. The neighbourhood makes great use of solar power: the Solar Settlement, within the district, is a group of 59 homes which became the first housing community in the world to display a positive energy balance. Excess electricity produced is sold to the grid, generating an income for the residents.

The neighbour is founded on a 'car free' approach, which as successfully resulting in levels of car ownership plummeting over time. Priority is given to walking and cycling and a tram provides a connection to the city centre.



# Innovation precedents



## Greater Manchester's Ignition Project

Ignition is a ground-breaking project that aims to develop innovative financing solutions for investment in Greater Manchester's natural environment.

This project, backed by €4.5 million from the EU's Urban Innovation Actions initiative, brings together 12 partners from local government, universities, NGOs and businesses. The partnership was successful thanks to the development of a shared vision and communal objectives.

The aim of the project is to develop the first model of its kind that enables major investment in large-scale environmental projects which can in turn increase climate resilience. By 2038 this will enable an increase in Greater Manchester's urban green infrastructure coverage by 10% from a 2018 baseline.



## Living Lab at Salford University

The University of Salford's new Living Lab aims to create a space where anyone can understand the financial benefits of nature based solutions, as well as their potential for climate change adaptation in towns and cities.

Starting in 2018, Living Lab is one of Ignition's first project. Co-design and collaboration have been at the heart of the development of the Living Lab since the beginning.

Thanks to clear communal governance frameworks, a tender for contractors was co-designed and issued in February 2020 for the design and subsequent construction of the Living Lab. The University's Estates, Procurement and other departments were also involved to ensure all design ideas fit with University processes.



## Cardiff City Council and Engenie

Cardiff City Council is working with Engenie to support the electrification of transport. Developing electric car infrastructure is a key focus of Cardiff Council.

Engenie is covering all costs associated with installing and servicing the rapid charging points. They will share profits with the council allowing the city to hit its ambitious climate targets, generate revenue and support its sustainable transport plans.

This alternative delivery models and partnerships allow council to deliver essential EV infrastructure whilst attracting private investment to their area.

# Innovation precedents

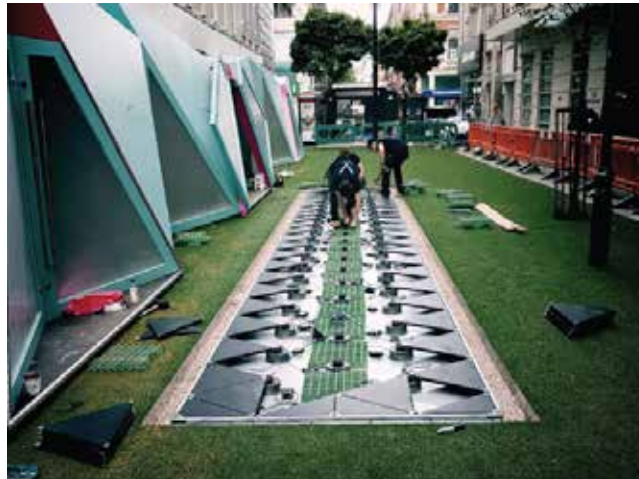


## **Bristol City Council, Bristol Energy**

Bristol Energy is just one of two fully licensed council-owned energy service companies in the UK. They work with 54 renewable generators around the UK from local community projects to large scale commercial generators like the National Trust and Thrive. 31% of renewable generation is sourced from the Bristol Area.

Bristol Energy is also working with Geneco a local energy innovator to launch 'green' gas. Waste from one million Bristol people is turned into biomethane to produce this green gas.

Bristol City Council has demonstrated leadership in setting up Bristol Energy. This high-risk endeavour has paid off with the energy service company thriving in a highly competitive industry.



## **Central Bedfordshire Council, ADEPT LAB**

Central Bedfordshire Council's Highways team has created an innovation programme in partnership with ADEPT LAB and Cranfield University.

The Highways team will trial three innovations: Solar Watt Way (trafficable photovoltaic surfacing designed to autonomously power equipment near the roadway), Power Road (roads capture solar energy which can be stored and distributed to nearby buildings) and Pave Gen (footsteps power a range of local applications including LED lighting, data capture and transmission and environmental monitoring).

The University will analyse the impact of these innovations in order to determine their carbon reduction potential. If successful, these innovations could be scaled up within Central Bedfordshire and help contribute to the council's sustainability plan.



## **West Lindsey District Council, Entrepreneurial Council**

In 2011, West Lindsey District Council set a new vision for its Corporate Plan: to become an entrepreneurial council with a social enterprise mindset.

The main goal was to become less dependent on formula or regional grants, be more innovative in investments and achieve income in other forms in order to meet the district needs. Thanks to this approach they have maintained frontline services, avoided redundancies and achieved net savings of £2,132,000 between 2009/10 and 2011/12.

Crucial to this municipal entrepreneurialism approach has been a commitment to valuing and developing the workforce as well as investments in developing the capacity of the local community.



## Social value precedents



### **Forest of Marston Vale, The Marston Vale Trust**

The Forest of Marston Vale is one of England's Community Forests. It was established in 1991 to use trees and woodlands to transform 61 square miles between Bedford and Milton Keynes, repairing a landscape scarred by decades of clay extraction, brickmaking and landfill.

The Marston Vale Trust is the independent charitable trust and social enterprise created in 1997 to take forward the creation of the Forest of Marston Vale and secure a long-term future. The Trust works with local communities, government and businesses to deliver the Forest. The Trust removed the delivery of the Forest from its original dependency on public sector core funding and now owns and operates the Forest Centre, a purpose-built visitor centre and conference centre within the Millennium Country Park, the Trust's flagship site, both constructed during 1999.



### **Library of Things, Crystal Palace**

The Library of Things movement is emerging in communities around the world. These spaces give people affordable access to a huge spectrum of items, from board games, party supplies and tennis rackets to saws, kitchen appliances, turntables, clothing and tents, without the burden of ownership.

The Library of Things in Crystal Palace challenges people to rethink whether they need (or want) to own goods they rarely use. Borrowing rather than owning goods reduces resource consumption and waste and widens access to a range of enjoyable and useful activities.



### **Remakery, Brixton**

The Remakery is a not for profit repair cafe and maker space in South London. Founded in 2012, it has fostered a community of makers, artists, local residents and enterprises that have been breathing new life and creativity into things destined for landfill.

It's strong social purpose is to develop resourcefulness and resilience within the community by:

- Tackling the lack of space for urbanites to craft, store as well as share ideas of their creative projects made out of reclaimed materials
- Encouraging people to actively rethink, resource, reuse and redistribute objects by hosting talks, discussions and workshops about the processes of remaking
- Upskilling the local community through subsidised training, volunteering and job opportunities in hopes of advancing their resilience and employability



## Social value precedents



### The Big Lunch

For one day in June, neighbours across the UK can enjoy the company of their community, as they are encouraged to sit down to a meal, on their own street. The Big Lunch is an annual, nationwide event inviting people to organise a community lunch. Last year, 94% of those taking part thought it benefited their community, and 65% of people would go on to organise another community event.

With funding from the Big Lottery, The Big Lunch has grown from 700,000 people in 2009 to 7.3 million in 2016. It was set up by Eden Project Communities - who can act as an intermediary between residents and councils to obtain permissions for street closure. Many councils now have streamlined processes, and waive the normal fees for road closures. On top of this, they provide advice through their websites. The Big Lunch seems to have become a catalyst for creating more active and resilient communities all over the UK.



### Bristol Energy / Ynni Padarn Peris

Bristol Energy sources renewable power from community energy projects around the UK. Community energy can be defined as a group of people who come together to generate, manage or own their energy production. They reinvest the profits generated from their renewable power to benefit the community.

Ynni Padarn Peris is a community energy group in Afon Goch, Wales. They generate renewable power through a hydro-electricity scheme consisting of a weir at the top of the mountain and a small turbine and generator at the bottom.

Bristol Energy buy the excess renewable electricity from Afon Goch. The money raised is reinvested to benefit local people in Snowdonia. The money is helping to tackle fuel poverty and fund local sustainability projects.



### Limehouse Social Market

Limehouse Social Market creates a place where local residents can meet and spend time, as well as an attraction for visitors. The market is financially self-sustaining, thanks to the efforts of a professional market operator and the landowner, who offers a fair licence agreement with a rent-free period to the market operator.

The not-for-profit landowner initiated a process to revitalise the underutilised space. MAAP (Media and Arts Partnership), a public arts consultancy, and The Decorators, a design collective, facilitated a co-design process with local residents. The team trialed different activities in the space, including moveable stalls and street furniture. By prototyping public space the community were empowered to rediscover its charm and feel safer.



# Vision and development context

Meridian Water is a major regeneration programme within the Lee Valley in the London Borough of Enfield. Over 10,000 homes and 6,000 jobs will be created over the course of the 25-year development.

## Placemaking Pillars

The Council is taking control of the vision for Meridian Water and overseeing its delivery, which is based around three placemaking pillars:

1. Parklife on your doorstep:  
The greenest development in London
2. Your place to make and create:  
London's new home for production
3. Mixed uses and animating streets:  
London's most active public realm.



Aerial view of the existing Meridian Water site

## Climate Emergency

There is a global climate, biodiversity and waste emergency. Nations across the world have declared a Climate Emergency, including the UK Government who were the first to make a legally binding commitment to net zero emissions by 2050.

In July 2019 Enfield Council signed a climate emergency pledge and their Climate Action Plan was adopted in July 2020 which commits to the Borough being carbon neutral by 2040 and sets out a plan to achieve this.

## Enfield Climate Action Plan

The Climate Action Plan covers 8 areas: Council Operations, travel, buildings, waste, energy, natural landscape, influencing others and financing the action. 6 of the areas include approaches and actions that will influence the Meridian Water development.

## Council Operations

This area sets out the Council's approach to offsetting, which focuses on three solutions: natural offsetting through green infrastructure, solar installation, wind technology. Local offsetting within the Borough should be prioritised. Meridian Water should follow this offsetting approach.

## Travel

Includes actions to support modal shift to active, efficient and sustainable transport modes, delivery and access to the borough's strategic cycling network and the provision of EV charging points. These actions and associated KPIs must be embedded in Meridian Water.

## Buildings

The plan requires all buildings to be carbon neutral by 2040 and resilient to climate change. All new residential development should follow passive principles and all non-residential buildings should achieve BREEAM 'Outstanding' or equivalent. Targets for reducing embodied carbon in buildings will be set in 2021.

## Waste

To achieve increased recycling rates and less waste Enfield are reviewing how waste is managed and collected at building scale. Meridian Water should consider innovative waste management solutions to support this. The Council are also supporting the NLWA low plastic zones initiative; Meridian Water should be a low plastic zone.

## Energy

The Plan sets out a diversification approach to energy in line with the Committee on Climate Change (CCC) recommendations. The Council will prioritise actions as follows: fabric first and insulation, second, switch to renewables with a target of increasing renewable energy by 2% per annum for 10-years, third, heat pumps to provide heat and summer cooling, fourth, decentralised energy and fifth, hydrogen. The energy strategy for Meridian Water should align with the Council's approach.

## Natural Landscape

Increased provision of tree planting and green/blue infrastructure are key actions. Meridian Water should make a significant contribution to the Borough's tree planting, establishment of new areas of woodland and wetlands as part of integrated flood resilience and water strategies.



Enfield Climate Action Plan, adopted July 2020