populo LIVING

Zero Carbon Roadmap

Strategy Report

June 2022

Notes

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Image: Dovetail community space

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1.0 Getting to Zero

Vision

Populo recognise the climate and biodiversity emergencies, and are committed to doing our part to help the UK achieve Zero Carbon emissions by 2050, or sooner. We have committed to being Net Zero Carbon as a business by 2030, and becoming the most sustainable landlord in Newham.

Purpose of this Document

This document deals solely with issues relating to carbon dioxide equivalent emissions, or global warming gases. Details of our wider approach to sustainability are available in our full suite of design documents.

See: Populo Housing Design Guide, Employers Requirements, Procurement Strategy

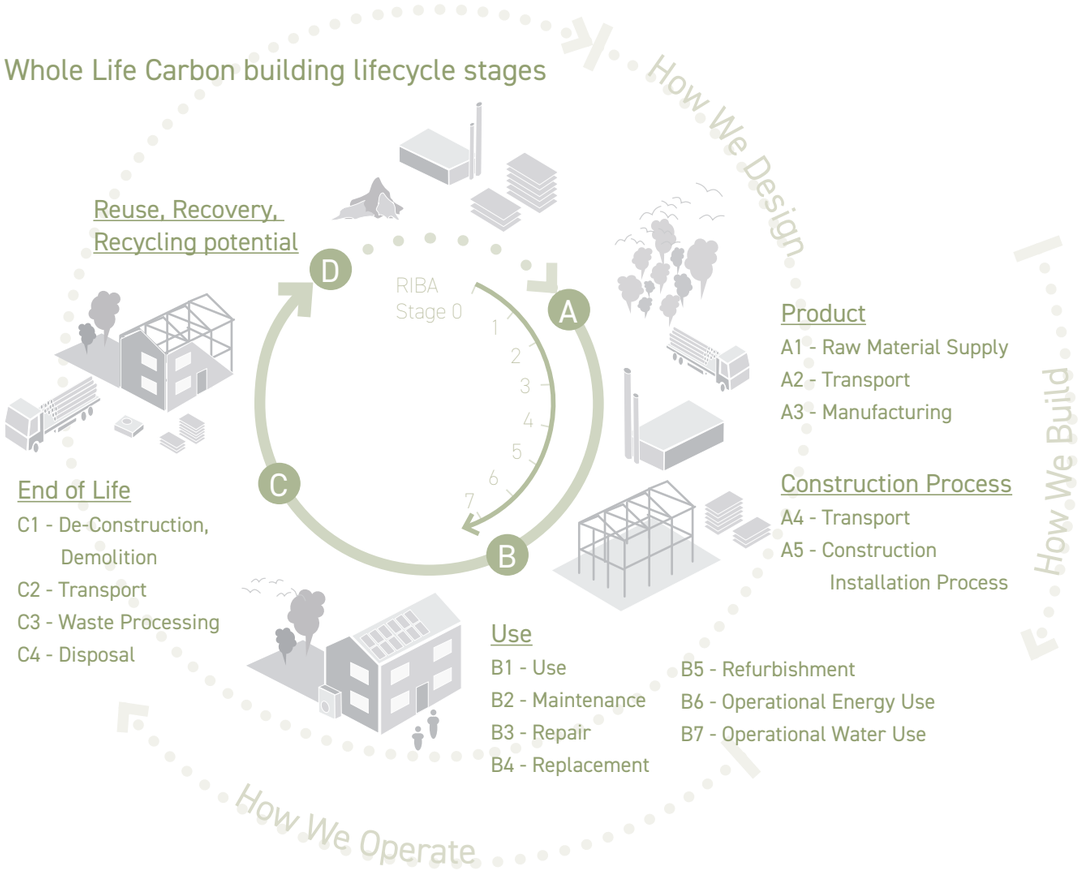
Our Approach

Our Approach to achieving Net Zero Carbon, can be summarised in five clear milestones:

1. Creating a whole life decarbonisation strategy across our entire operations by 2022
2. Have a clear strategy for eliminating fossil-fuel use and using 100% renewable electricity by 2030
3. Using “smart” systems to monitor and optimise efficiency in all our buildings by 2030
4. Require our supply chain partners to deliver zero whole life carbon on site by 2030
5. Do all we can to minimise the amount of carbon we need to offset by 2030

Image (right): The full scope of carbon emissions proposed to be measured

Whole Life Carbon building lifecycle stages



Using this Document

This document is a tool for achieving Populo's Zero Carbon ambition, whilst also setting out key performance indicators and target actions which we will investigate.

Signposts are included wherever another standard or document should be referred to. In doing this we hope to avoid duplication and error when policy, regulations or legislation changes.

The guide must be read in conjunction with the Other Populo Documents listed in the signpost boxes. All of these contribute to delivering on our ambition.

Signposts to document(s) which the reader **must** refer to

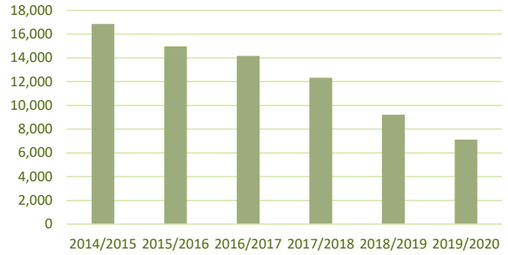
Key design metric(s) which **must** be reported on during the project workstages

Image (right): Inspection of completed units at Wordsworth Avenue in 2021

1.0 Getting to Zero

Regulatory Context

The UK government has declared a Climate Emergency, committing to achieving net zero carbon by 2050. There are a number of key actions aimed at delivering this target that impact the construction industry including supporting the roll-out of low and zero carbon technologies, promoting sustainable transport, restoring the UK's natural environment and delivering a circular, zero waste economy.



Newham Council's reported carbon emissions to date

The Mayor, Rokhsana Fiaz, has to pledged to make the London Borough of Newham carbon neutral by 2030 and carbon zero by 2050.
Newham Council has recently adopted a Housing Strategy and Populo plays a central role in delivering those outcomes. The strategy sets out 6 areas for priority action, including: "Addressing the Climate Emergency – emphasising the importance of sustainability in development projects."

Defining Net Zero

The Science Based Targets initiative (SBTi) has defined Net Zero targets for corporates as follows:
'To reach a state of net zero emissions for companies implies two conditions:

1. To achieve a scale of value-chain emission reductions consistent with the depth of abatement achieved in pathways that limit warming to 1.5°C with no or limited overshoot and;
2. To neutralise the impact of any source of residual emissions that remains unfeasible to be eliminated by permanently removing an equivalent amount of atmospheric carbon dioxide.'

Scope of the Strategy

This document sets out a strategy to achieve Populo's Zero Carbon goals across all of our work areas. Scopes 1, 2, and 3 have been included, alongside some of the wider impacts of our design work.

Separate time frames are set out for some actions which are not directly attributable to Populo, such as the adoption of zero carbon energy suppliers by our tenants

We have split our work into the following areas:

How We Work

All office operations, staff commuting and transport to and from development sites

How We Build

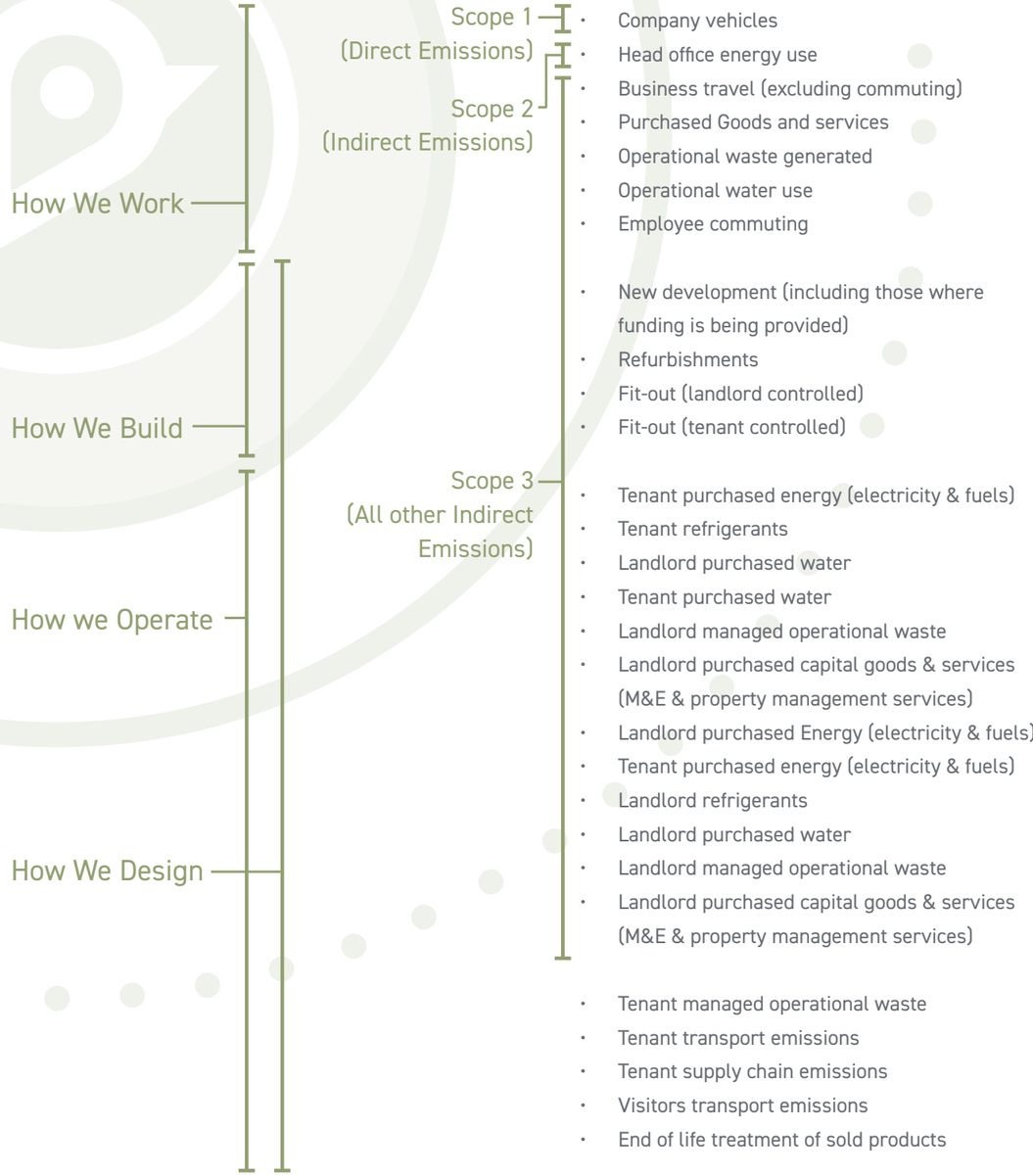
All on-site operations, including; energy sources, waste generated, and transport of goods and people.

How We Operate

Energy and water use, maintenance and replacement

How We Design

Urban design, reduction strategies, specification of materials and systems



See: Section 2.5: Scope of Commitments

1.0 Getting to Zero

Monitoring and reporting of strategy

This strategy will be continually monitored by our Sustainability Manager, overseen by our Deputy CEO. We will review all projects as they progress, and publish a report and update the board annually with updates on targets.

We will investigate options to ensure transparency in our progress against our commitment through reporting and disclosure

1. Review options for independent assurance of data within our Annual Report
2. Align target setting with existing and emerging industry benchmarks, and verify methodology with Science based Targets initiative (SBTi)
3. Continue independent certification of schemes (including PassivHaus and BREEAM schemes)
4. Propose a plan to become ISO:14001 accredited.

Reporting metrics

While we aim to decrease carbon, our business plan involves expanding our current stock of homes. As the business expands we will use metrics such as carbon per home built, per £ of revenue, and per resident to judge our progress. This will allow us to continually improve our operations, new projects, and retrofit existing projects to achieve Net Zero by 2030.

- tCO_2e/m^2 GIA
- tCO_2e/home

Governance

We will continue the establishment of a Sustainable Finance Framework aligning our strategic sustainability objectives with our funding and financial strategy. This will include the following actions:

1. Appoint Board-level sponsorship and report progress annually against our commitment and emerging targets to senior leadership
2. Adopt and implement an internal carbon price mechanism to inform strategic and tactical decision making
3. Establish internal oversight with cross-business representation to ensure delivery across business activities
4. Develop and build capacity, expertise and knowledge through proactive employee engagement in a series of talks and workshops
5. Review our roadmap and milestones on an annual basis to inform business planning
6. Continue to review our targets aimed at de-carbonisation on a minimum 2 year basis
7. Incorporate meaningful and measurable sustainability metrics into executive performance objectives from 2023.

Reporting: Annual
Carbon price mechanism: £/tCO_2e

Image (right):
Romford Road
in Manor Park
Designed by Peter
Barber Architects

Populo's Current Impact

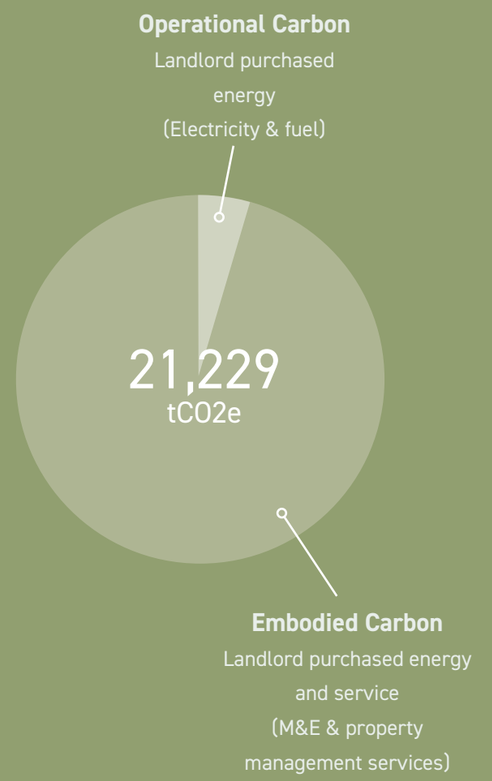
In December 2021 Populo had 366 homes in management with 203 homes completing construction. Based on generic assumptions for whole life carbon impact this equates to approximately 21,229 tons of Carbon dioxide equivalent emissions (tCO2e , Scopes 1-3).

This equates to:

- 1321 tCO_2e per m^2 of new gross internal area (GIA) built.
- 111 tCO_2e per new home built
- 60 tCO_2e per home in management

This would equate to an annual offset payment circa £2 million at the standard Newham rate of £95 / tCO_2e.

See: Section 2.5 : Financial Impact



2.0 Reduction Strategies

Timeline and Key Actions

We have produced an indicative timeline for carbon reduction based on continual analysis of our total carbon impact across all areas of the business.

The adjacent graph shows the major actions required to meet our zero carbon targets, and will be regularly updated with progress to date. Initial actions are mostly behavioural, both in terms of our internal operations, and those of our external partners. Later actions focus on retrofitting our existing stock and developing zero whole life carbon homes, once we have a wealth of data collected.

Actions cover the impacts from the scopes 1, 2 and 3, from how we work to how we operate. Annual Carbon emissions are shown separately rather than as a cumulative total . Total Emissions are shown separately from offsets to encourage on site reductions.

The following sections of the document present a range of targets for key actions to take towards this overall goal, alongside KPIs that will be used to track our progress.

KPI	Units	Target
Embodied Carbon	$kgCO_2e/m^2$	< 625
Operational Energy	$kWh/m^2/yr$ EPC band	< 60 >B
Operational Water	l/person/ day	< 75
Energy Generation	% Of total energy demand	< 30

Annual Net Carbon Emissions (tCO_2e)

2023
Monitor and Reduce the use of fossil-fuels from construction sites by 20%

2022
Develop retrofit strategies for all current homes with gas boilers

2021
All new designs are 100% electric

2025
Standardised Smart systems and Post Occupancy Evaluation

2030
Reduce Scope 1 and 2 emissions by 90%, and offset all remaining Scope 1-3 emissions

2033
Carpenters estate regeneration complete

2037
Measure and reduce whole life carbon on all new developments in real time using Digital Twins

2040
Net Zero whole life carbon of all new homes

2050
Zero Carbon UK

Image (right): Site inspection visit to Plaistow Hub

2.1 How We Work

Vision

We are committed to showcasing best practice in our office and day to day business operations. The majority of our impacts in this section are scope 1 impacts, which are directly under our control and should be some of the simplest and therefore earliest action we take.
We are committed in our business strategy to:

Achieve Net Zero Carbon within our core business activities by 2030

We intend to use our own directly controlled assets to showcase best practice and act as a demonstration for our contractors and other collaborators to follow.

Our strategy in this area will focus on the following key themes:

- Energy and Water use
- Office supplies
- Waste generated
- Travel to work and site

Progress to Date

Populo occupy an office in Stratford which is a part of a meanwhile use in an ongoing regeneration project of ours. We will use this office to learn lessons which we can use to develop targets for the development of our next offices as our regeneration project is built out and we move to the next site.

- We employ 36 staff in one office, and encourage staff to work from home where possible.
- We do not have any staff vehicles
- Staff travel for business is subsidised, and primarily takes place via public transport, with some private car hire for more hard to reach sites
- We do not subsidise any flights
- We provide secure cycle parking, lockers and showering facilities for staff and guests.
- We encourage and support home working through a range of initiatives
- We have recycling bins in all of our office areas which staff are encouraged to use.
- We are currently instigating a new online system for closer monitoring of purchasing of office supplies
- Our waste and recycling collection is managed by the London Borough of Newham
- We have a range of paper free office initiatives

Monitoring and reporting of strategy

Bespoke monitoring strategy following our KPIs is being developed through collaboration with our suppliers to enable us to track the carbon impact of all our operations.

Key initial actions include:

- We will create new administration systems to track and record all metrics proposed here
- We propose to install smart meters for gas, water and energy in our offices which we will review at ZCR 2030 meetings and in our annual carbon accounting.
- We will work with existing suppliers and waste contractors (as well as assessing new suppliers) to be able to better calculate the carbon impact of their activities.
- We will ballot staff on their use of transport for commuting and site visits, as well as asking about wider behavioural changes which we would like to encourage to reduce our staff's carbon impact.
- Ensure that all landlord procured supplies are REGO or RGGO backed energy sources in line with industry best practice criteria
- Explore alternate off-site procurement routes that demonstrate credible additionality including PPAs
- Identify our approach to carbon offset aligning with industry best practice criteria with a longer term ambition beyond 2030 to reduce reliance on carbon offset

See: Section 2.5: Scope of Commitments
Populo Sustainable Procurement Policy

Image (left): Topping out ceremony with the Mayor at Grange road

2.1 How We Work

Delivery Strategy

The following table summarises proposed key actions which we aim to implement by the target dates. Over time an average financial cost of carbon reduction for each action will be determined and compared to the cost of offsetting methods. Strategies are split by topic, and broadly organised into:

Short Term

Actions up to 2025, largely consisting of climate change mitigation actions such as improvements in energy efficiency

Medium Term

Up to 2030, mostly resilience actions such as ensuring cooling systems can cope with higher temperatures

Long Term

Up to 2050, adaptation measures to align with a zero carbon economy and new climate paradigm

Topic	Metric	Units	Delivery Strategy	Target Date
ENERGY USE	Office energy use	$tC0_2e$ / yr.	Switch electricity and gas suppliers to most sustainable available	2022
ENERGY USE	Smart systems		Install smart gas, water and electricity meters	2022
ENERGY USE	IT equipment	kWh/year	Investigate opportunities to reduce energy use of IT equipment	2022
ENERGY USE	Office energy use	$tC0_2e$ / yr.	Review the use of our offices in the context of home working and compare how this affects CO_2e emissions	2022
RENEWABLE ENERGY	Energy Supply Agreement	% Of landlord supplies (REGO/RGGO)	Procure 100% REGO-backed electricity from clean renewable sources	2022
WHOLE LIFE CARBON	Office assessment	$tC0_2e$ / yr.	Fully assess carbon impact of office operations using independent 3rd party	2023
WHOLE LIFE CARBON	Office design	$tC0_2e$ / yr.	Net zero whole life carbon of our offices	2028
OFFICE SUPPLIES	Printer use	$kgCO_2e$ / page	Monitor use of printers and potentially switch contracts or reduce number	2022
OFFICE SUPPLIES	Cleaning Products	% Of total	Increase the proportion of sustainably sourced cleaning products to 80% (soap, toilet roll, washing up liquid etc.)	2022
OFFICE SUPPLIES	Complimentary Food	% Of total	Increase the proportion of sustainably sourced food offerings to 80% (coffee, tea, sugar etc.. provided for meetings)	2022
OFFICE SUPPLIES	Furniture	% Of total	Increase the proportion of sustainably sourced furniture as it needs replacing	2022
OFFICE SUPPLIES	Deliveries	% Of total	Investigate getting more deliveries by electric vehicles, cargo bikes, and other low carbon means	2023
OFFICE SUPPLIES	Stationary	% Of total	Increase the proportion of sustainably sourced office goods to 80% (stationary,	2023
WASTE	Recycling	% Of total	Create processes to ensure that at least 80% of our office waste is recycled	2023
WATER USE	Fixtures efficiency	Total l/person/day	Install low flow fixtures and fittings in all office space	2023
TRANSPORT	Staff commuting	Miles per method	Ballot staff on methods of commuting transport and seek to reduce through incentives including cycle to work scheme	2022
TRANSPORT	Cycling facilities	% Of staff	Conduct a review and improve cycling facilities (provide more secure storage)	2023
TRANSPORT	Low carbon vehicles	Number of vehicles/ person	Provide electric cycle/ other low carbon vehicles for use of staff locally for site visits	2025

Image (right): Central garden area at the Didsbury

2.2 How We Design

Vision

This is critical to our Zero Carbon Roadmap since the decisions here influence how much carbon (embodied and in use) is created over the lifecycle of the assets we then build and operate. It is not just about new buildings, but the redesign or retrofit of all homes in our portfolio which have fossil fuel connections, or don't meet modern energy efficiency standards.

Transport

Provision of cycling spaces and electric vehicle charging will be tracked on all projects.
Projects within areas with higher public transport provision will be targeted for more dense developments and higher provision of sustainable transport initiatives.

Materials and waste

Our Procurement guidelines will be used to judge selection of suppliers and contractors
We will require all larger site s to measure waste volumes and set increasingly tough targets with the aim of no waste sent to landfill

Post Occupancy Evaluation

Projects will be designed to aid the POE process and the collection of data throughout their lifetimes. This information will be used to continually review and improve our design strategies.

Progress to Date

Populo currently has circa 4500 homes in development, and 366 under management, and may bring other projects online before 2030.

We take a whole life carbon approach to reducing our carbon impact across our portfolio, and throughout the lifecycle of our projects. This is compared to lifecycle cost projections, and social value studies as part of our triple bottom line accounting approach when assessing the viability of new developments.

We will continue to follow all relevant guidance of, and continue to collaborate with the RIBA, UKGBC, LETI, RICS, CIBSE, and all other relevant bodies, particularly with regards to whole life carbon accounting.

We will seek for all new build homes to achieve operational net zero carbon by 2025, as defined by the UK Green Building Council (UKGBC), to avoid the need for future retrofit works.

Where the cost of meeting net zero carbon is detrimental to project viability we will consider the level of sustainability we can reach and highlight the gap and cost to achieving. We will present options as part of the approval for current alterations, and future retrofit works.

Monitoring and reporting of strategy

We will use a 'fabric first' approach on our new homes before considering the use of mechanical or electrical building services systems. Our Employer's Requirements will be regularly updated to ensure best practice as well as linking effectively with our retrofit programme.

Whole Life Carbon

We follow the recommendations of the UKGBC Net Zero Whole Life Carbon Roadmap for the Built Environment, and continue to actively participate in its development. This represents a common vision and agreed actions for achieving net zero carbon in the construction, operation and demolition of buildings and infrastructure, and will be used to guide our design process.

Embodied Carbon

We will review existing schemes to maximise ongoing opportunities to reduce Embodied Carbon in line with revised targets

The majority of projects should be delivered utilising Modern Methods of Construction (MMC) where most appropriate to support our aims for net zero carbon, standardisation, and fire safety. Any utilised technology will have undergone testing and continuous learning to ensure its suitability, robustness and acceptable life cycle costs.

Operational carbon

We will adopt Passivhaus principles across all key development projects and consider application for existing developments.
We will continually improve data quality and quantity using smart systems and POE of our existing estate, and use this to guide future designs and strategies.

See: Populo Design Guide
Populo Sustainable Procurement Policy

Image (left): Wordsworth Avenue, completed in 2021 by Populo.

2.2 How We Design

Delivery Strategy

The following table summarises proposed key actions which we aim to implement by the target dates. Over time an average financial cost of carbon reduction for each action will be determined and compared to the cost of offsetting methods. Strategies are split by topic, and broadly organised into:

Short Term

Actions up to 2025, largely consisting of climate change mitigation actions such as improvements in energy efficiency

Medium Term

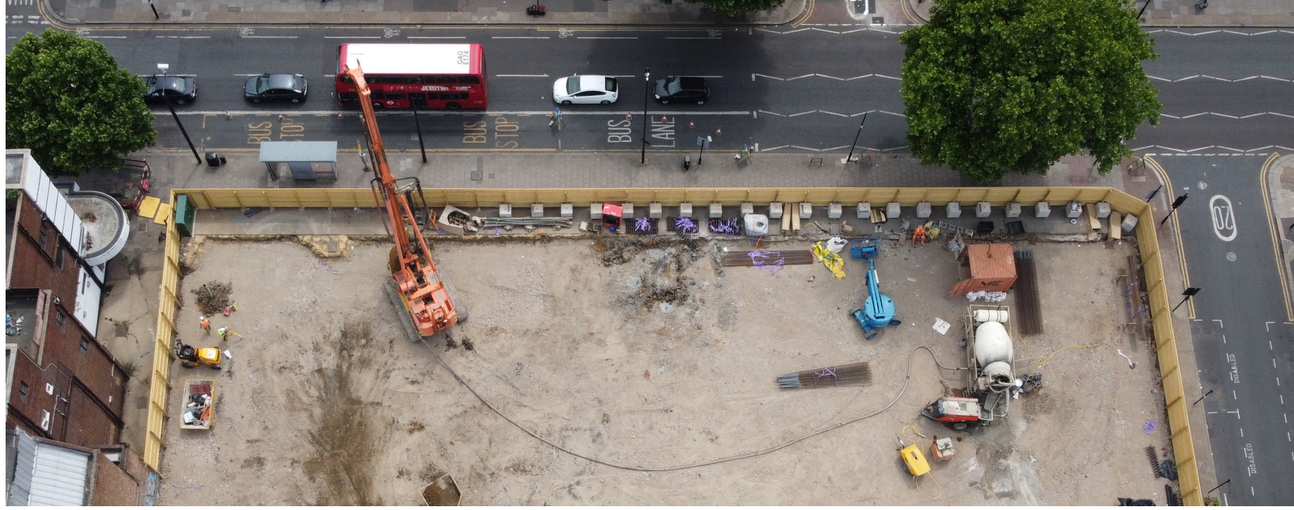
Up to 2030, mostly resilience actions such as ensuring cooling systems can cope with higher temperatures

Long Term

Up to 2050, adaptation measures to align with a zero carbon economy and new climate paradigm

Topic	Metric	Units	Delivery Strategy	Target Date
OPERATIONAL CARBON	Fossil-fuel use	% Of total homes	No new buildings to be designed with gas connections for homes	2021
OPERATIONAL CARBON	EPC band	% Of new homes	100% of all new homes built by us are minimum EPC B (SAP 81)	2022
OPERATIONAL CARBON	Building User Guides	% Of total homes	100% of new homes include energy, water, waste and sustainable transport advice in a simplified Building User Guide (for management), and Home User Guide (for tenants)	2022
OPERATIONAL CARBON	Smart systems	% Of new homes	Integrate smart systems into all new developments as standard. Create standard specification for systems and controls based on POE studies.	2024
OPERATIONAL CARBON	Net Zero Carbon	$kgCO_2e$	All new homes designed to be net zero operational carbon	2030
EMBODIED CARBON	Specification	-	Review all standard specification products to investigate more sustainable alternatives (use of FSC, EPDs, etc..)	2022
EMBODIED CARBON	Concrete	$kgCO_2e/m^2$ GIA	Assess the viability of a range of low carbon concrete mixes on live schemes.	2023
EMBODIED CARBON	Pre-demolition Audits	% Of new homes % Of material reuse	Ensure a pre-demolition audit is carried out for all demolition, and options for retention are considered. Set targets for material reuse % on all projects.	2023
EMBODIED CARBON	Environmental Product Declarations (EPD)	% Of products by weight or cost	All products specified to have an EPD certificate with embodied carbon data used as part of WLC calculation	2030
WHOLE LIFE CARBON	Modelling	$kgCO_2e/m^2$ GIA	All new designs to have a designed pathway to net zero whole life carbon by 2030 as part of viability assessments	2022
WHOLE LIFE CARBON	Assessment	% Of total homes	Ensure that 100% of new projects are designed to Populo's sustainable construction requirements in the specification, and undertake WLC for each scheme	2023
WHOLE LIFE CARBON	Net Zero	% Of total homes	All new homes net zero whole life carbon	2040
TRANSPORT	Electric vehicle charging	% Of new homes	Electric vehicle charging points for all vehicle parking spaces in new developments	2022
TRANSPORT	Cycle storage	% Of total homes	Provide wheelchair / bike storage in all new homes, or access to communal stores following best practice set out in Populo design guide	2022
TRANSPORT	Cycle storage	% Of total homes	Secure cycle storage provided for 10% of residents following the guidelines in our housing design guide. With light electric vehicle charging points	2025
RESILIENCE	Climate change	% Of total projects	Undertake climate-related risk assessments on all major projects and incorporate a shadow price on carbon	2023

Image (right) : Site Preparations at the Hartley Centre in 2022



2.3 How We Build

Vision

We need to challenge our supply chain to minimise carbon emissions during the construction phase, including seeking to eliminate the use of fossil-fuels from construction sites. Developments should promote circular economy outcomes and aim to be net zero waste, diverting 100% of construction waste from landfill.

Our strategy in this area will focus on the following key themes:

- Energy and Water use
- Material supplies
- Waste generated
- Travel and deliveries to site
- Site accommodation
- Tools and plant

Progress to Date

Populo encourage sustainability across all of our construction sites. This is done through a series of guidelines as referenced below, which we are committed to updating and reviewing at regular intervals.

The retrofit agenda is key to achieving our vision, as we regenerate project like those pictured below we inevitably reduce the amount of materials used, and therefore site waste and deliveries. This also helps achieve some of our social ambitions for Newham by reducing the need for polluting vehicles to visit the site.

See: Sustainable Procurement Policy

Monitoring and reporting of strategy

In major schemes a Construction Management Plan (CMP) will be produced as well as a demolitions management plan (DMP).

- Contractor to set targets for monitoring & reporting: energy, fuel and water use and waste referencing WRAP (Waste and Resources Action Programme) targets.
- The Contractor will regularly report on progress of measures at client meetings. At completion the Contractor will summarise the final figures for energy and fuel, water, transport and waste against the set targets. Where the targets have not been met an explanation should be given.
- Encouraging the introduction of the BRE 'SMART Waste' tool on our construction sites to better monitor and manage waste production and recycling.
- Early procurement of temporary electrical services (pre-construction %) with UKPN will be encouraged on all sites

Tenure Category	Homes	%
Market Sale	-	-
Market Rent	1934	42%
London Affordable Rent	1560	34%
London Living Rent	1027	22%
Shared ownership	8	0.1%
LHA (TA)	-	-
Total	7402	

Homes under design and development - Jan 2022

Carbon from demolition and decommissioning

This is currently outside the scope of our definition of Net Zero Carbon but impacts will be considered in decision-making (see Waste below). The industry has a long way to go in developing appropriate tools to manage and evaluate net zero carbon for construction and end of life. We will however collect data on this and seek to make improvements.

Procurement

We will drive responsible sustainability- related activity through our procurement and contracts. Our procurement evaluation measures and contract management will give an advantage to those who adopt stronger measures to improve performance against the ESG measures.

Transport

We will record on all major developments, and investigate methods to increase the accuracy of data collected for transport use on projects. This will cover both transport of materials and people.
We will aim to increase "last mile" deliveries wherever possible as a priority. We will continue to investigate low carbon fuels and forms of transport can be integrated into our construction processes and encourage contractors to adopt the latest technologies.

Image (left): Redevelopment of existing buildings at Fireman's Reach

2.3 How We Build

Delivery Strategy

The following table summarises proposed key actions which we aim to implement by the target dates. Over time an average financial cost of carbon reduction for each action will be determined and compared to the cost of offsetting methods. Strategies are split by topic, and broadly organised into:

Short Term

Actions up to 2025, largely consisting of climate change mitigation actions such as improvements in energy efficiency

Medium Term

Up to 2030, mostly resilience actions such as ensuring cooling systems can cope with higher temperatures

Long Term

Up to 2050, adaptation measures to align with a zero carbon economy and new climate paradigm

SHORT TERM → MEDIUM TERM → LONG TERM

2025 | 2030 | 2050

Topic	Metric	Units	Delivery Strategy	Target Date
ENERGY USE	Local energy generation and low carbon fuels	Total energy produced: MWh Proportion of site demand: %	Use of at least one of the following innovative technologies on all sites: Solar hoarding lights, Crane lights on battery power, electricity powered pumps / agitators , electric forklifts, hydrogen plant, or equivalent	2023
ENERGY USE	Fossil-fuel reduction	% Of total energy use	Monitor and Reduce the use of Diesel (and all fossil-fuels) from construction sites by 20%	2023
ENERGY USE	Energy generation	$kgCO_2e$	Trial a 100% zero carbon energy powered construction site	2024
ENERGY USE	Site accommodation	$kWh/m^2/yr.$	Efficiency of welfare facilities (EUI, U-values, systems etc.) recorded for all sites with smart meters	2025
ENERGY USE	Fossil-fuel reduction	% Of total energy use	Reduce fossil-fuel use to zero on all construction sites	2030
EMBODIED CARBON	Procurement	$kgCO_2e/m^2$ (GIA)	Establish strategic procurement frameworks with partners who can deliver against our targets and begin to immediately reduce embodied carbon	2024
WHOLE LIFE CARBON	Building Integrated Modelling (BIM)	% Of new homes	Transition to BIM level 2 inclusion with designated architects in the design & delivery	2022
WHOLE LIFE CARBON	Supply chain conference	% Of new homes	Hold a supply chain conference to educate and onboard suppliers with our targets	2023
WHOLE LIFE CARBON	Offsite Construction	$kgCO_2e/m^2$ (GIA)	Calculate whole life carbon impact of a range of offsite construction methods on live projects, and make changes to standard specifications.	2024
WHOLE LIFE CARBON	Assessment	$kgCO_2e/m^2$ (GIA)/yr	Measure and reduce whole life carbon on all new developments in real time using Digital Twins	2030
WHOLE LIFE CARBON	Offsite Manufacturing	-	Investigate setting up an offsite manufacturing facility in Newham	2030
MATERIALS	Supply chain contracts	% Of new homes	Trial the use of Zero carbon supply chain contracts	2025
WASTE	Documentation	% Of new homes	In 100% of major schemes a Construction Management Plan (CMP) produced as well as a demolitions management plan (DMP).	2022
WASTE	Contract review	% Of new homes	Review all current contracts for waste and power and move to more sustainable providers	2023
WASTE	Diversion of waste from landfill	%, tonnes (Total, diversion from landfill, reuse/ recycle)	Zero waste sent to landfill from all construction sites	2030
WASTE	Waste transfer system	% Of new homes	Application of Electronic Duty of Care (EDOC) waste transfer system to reduce paper usage on all sites	2030
WASTE	Demolition	% Of new homes	Mandate full accounting of embodied carbon of demolition activities	2040
WATER USE	Monitoring	% Of new homes	Monitor water consumption on all sites, and reduce to below industry benchmarks	2025
TRANSPORT	Cycle facilities	% Of new homes	Cycle storage and facilities (shower, drying rooms, lockers) provided for at least 5% of workforce on all major sites	2022
TRANSPORT	Deliveries	% Of new homes	All deliveries to site to take place via electric vehicle	2050

Image (right):
Interior of
Romford road,
Manor Park

2.4 How we Operate

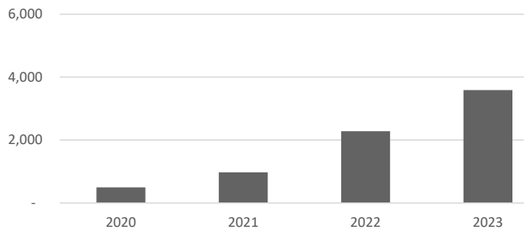
Vision

For our existing assets and those currently in construction we will plan for de-carbonisation as part of an asset management plan, following a fabric first approach to retrofit and regeneration. Our strategy in this area will focus on the following key themes:

- Fossil-fuel reduction
- Resident energy use
- Resident water use
- Renewable energy supplies

Tenure Category	Homes	%
Market Sale	-	-
Market Rent	233	63%
London Affordable Rent	125	34%
London Living Rent	-	-
Shared ownership	8	2%
LHA (TA)	-	-
Total	366	

Homes currently under management



Predicted Operational Carbon Impact for 2020-23

Progress to Date

Populo currently manages, or is developing for management over 7400 homes in Newham. The majority of our homes have been designed and built within the last 5 years and therefore are built to high standards of efficiency.

- The average EPC rating of the properties we manage is currently being researched in detail as part of a post-occupancy evaluation assessing the need for retrofit.
- Using an appropriate benchmark equates to annual operational carbon emissions of approximately 494 tCO_2e (scope 3)
- Embodied carbon emissions across our estate are estimated to be 40,000 tCO_2e

While we cannot mandate directly how tenants use energy and water, we have some control of the sources of energy and water and we have a lot of control over the efficiency through specification of fixtures and fittings, as well as general energy efficiency standards of new and refurbished housing.

We will also engage directly with our residents and support them to achieve low carbon lifestyles in areas outside of the defined scopes.

Monitoring and reporting of strategy

Our strategy will focus one improving data quality on energy, water and waste performance of our directly managed assets, including coverage to customer-procured energy and water, and indirectly managed assets including head leases. We will identify suitable projects for renovation, prioritising people in fuel poverty and homes with poor EPC ratings.

Post occupancy evaluation will be used to analyse how functional and comfortable our buildings are after users have been fully occupying it for at least 12 months.
We aim to be assessing a sample of all projects and using this to inform future development. We will also assess a number of existing properties using the same methodology to identify any remedial actions which need to take place.

Green Leases

A 'green lease' is a lease that incorporates clauses whereby the owner and the occupier undertake specific responsibilities/obligations with regards to the sustainable operation/occupation of a property. Currently they are predominantly used in the commercial sector.
We will trial a number of different approaches to define the most effective approach to achieve the carbon reduction targets set out in this document.

Renewable Energy

We will optimise approach for renewable electricity procurement that adheres to industry best practice. We will also investigate the installation of renewable energy generation equipment on all new and existing projects.

Operational carbon

Develop net zero asset level plans to establish the trajectory and inform asset level initiatives required to achieve net zero
Eliminate fossil-fuel use across estate
Exploit opportunities for digital infrastructure and technology advancements to enable data acquisition and analysis, as well as proactive maintenance and management of real estate

Renovation

Renovation of existing homes that improve unit EPC ratings by at least two notches (to EPC C or above) will be prioritised. We will consider the application of EnerPHit retrofit standards for existing developments

See: Populo Sustainable Procurement Policy

Image (left):Community engagement sessions held at the Carpenters estate

2.4 How We Operate

Delivery Strategy

The following table summarises proposed key actions which we aim to implement by the target dates. Over time an average financial cost of carbon reduction for each action will be determined and compared to the cost of offsetting methods. Strategies are split by topic, and broadly organised into:

Short Term

Actions up to 2025, largely consisting of climate change mitigation actions such as improvements in energy efficiency

Medium Term

Up to 2030, mostly resilience actions such as ensuring cooling systems can cope with higher temperatures

Long Term

Up to 2050, adaptation measures to align with a zero carbon economy and new climate paradigm

SHORT TERM (2025) → MEDIUM TERM (2030) → LONG TERM (2050)

Topic	Metric	Units	Delivery Strategy	Target Date
TENANT AGREEMENTS	Green leases	% Of homes	Develop green leases appropriate for Commercial and Residential areas to test zero carbon precedents	2024
OPERATIONAL CARBON	Electrification	% Of total homes with gas connections	Detailed plans for the elimination of gas boilers from our estate as soon as it is feasible to implement the necessary fabric improvements to install heat pumps.	2022
OPERATIONAL CARBON	Tenant advice	$kgCO_2e/m^2$ (GIA)/yr.	Provide energy use information to communal heating dwellings to help change behaviour. Provide continuous advice, education and behaviour change to help residents use energy efficiently, supported by a programme to offer energy advice to all of our residents with a target of an average of 10-20% saving in energy use.	2023
OPERATIONAL CARBON	EPC band	Distribution of EPC ratings of existing homes	Achieve an average EPC B in our rented stock by creating costed remedial action plans for all properties under EPC C	2023
OPERATIONAL CARBON	Home User Guides	% Of total homes	Provide a standardised, simplified home user guides and guidance to all residents	2024
OPERATIONAL CARBON	Smart metering	% Of total homes	Increase installation of smart meters in new and existing properties. Aim for 60% of portfolio	2025
OPERATIONAL CARBON	Post Occupancy Evaluation	% Of total homes	Standardised POE process carried out for 5% of portfolio	2025
ENERGY GENERATION	Total capacity of renewable energy installations, and power purchase agreements	kWp % Of total energy demand	ESCo arrangements in place for all properties connected to district heating and CHP. Aim for Solar Photovoltaic (PV) installations on 30% of projects	2026
WHOLE LIFE CARBON	Assessments	$kgCO_2e/m^2$ (GIA)/yr.	Simplified WLC assessment based on floor areas and systems chosen for all developments (RICS A-C)	2022
WHOLE LIFE CARBON	Acquisitions	$kgCO_2e/m^2$ (GIA)/yr.	Target that all new property acquisitions are compliant with our carbon target milestones	2023
WHOLE LIFE CARBON	Assessments	$kgCO_2e/m^2$ (GIA)/yr.	Carry out detailed (GLA compliant) whole life carbon modelling of a selection of existing schemes to better understand the impact of design decisions and plot a routemap to zero carbon for each scheme	2024
WHOLE LIFE CARBON	Zero carbon pathways	$kgCO_2e/m^2$ (GIA)/yr.	Create detailed pathways to zero whole life carbon for all managed properties	2030
WASTE	Recycling provision	% Of total homes	Review provision of suitable space for separation of recyclable waste at all properties and make improvements where necessary.	2024
TRANSPORT	Low carbon transport encouragement	Number of events per resident	Hold 3 cycle maintenance, and 1 EV event per year for residents	2023
TRANSPORT	Electric Vehicle Charging	% Of total spaces	Install electric chargers in 100% of all car parking spaces	2025

2.6 Glossary of Terms

Carbon or Carbon dioxide equivalent (CO_2e)

"Carbon dioxide equivalent" or "CO_2e" is a term for describing different greenhouse gases in a common unit (most commonly methane and refrigerants, which are significantly more damaging than CO_2). For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact.

Net Zero Carbon (NZC)

Calculating and reducing all scope 1-3 carbon emissions operations and work and offsetting all remaining carbon impacts

Whole Life Carbon (WLC)

The carbon emissions resulting from the construction and the use of a building over its entire life, including its demolition and disposal.

Embodied Carbon (EC)

All the CO_2e emitted in producing materials. It's estimated from the energy used to extract and transport raw materials as well as emissions from manufacturing processes.

Operational Carbon (OC)

The emissions of carbon dioxide and other global warming gases during the in-use operation of a building.

Post Occupancy Evaluation (POE)

The process of obtaining qualitative and quantitative feedback on a building's performance in use. POE is valuable in all construction sectors, where poor building performance will impact on running costs, occupant well-being and business efficiency.

Modern Methods of Construction (MMC)

A process which focuses on off-site construction techniques, such as mass production and factory assembly, as alternatives to traditional building. Similar to DfMA, of "Offsite Construction".

Building information modelling (BIM)

A process supported by various tools, technologies and contracts involving the generation and management of digital representations of physical and functional characteristics of buildings and places.

Building Management System (BMS)

A BMS is a computer-based control system which is installed in a building which monitors and controls the mechanical and electrical equipment e.g. lighting, heating, cooling and security systems.

Greenhouse Gas (GHG) Protocol Corporate Accounting standard

This internationally recognised standard sets out methodologies for businesses to collate, calculate and report all the GHG emissions they produce.

Renewable Energy Guarantees of Origin (REGO)

The REGO scheme administered by Ofgem provides transparency to consumers about the proportion of electricity that supplier's source/provide from renewable generation.

Science Based Target initiative (SBTi)

A collaboration between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the Worldwide Fund for Nature (WWF). The SBTi defines and promotes best practice in science-based target setting and independently assesses and approves companies' targets. Science-based targets provide companies with a clearly defined pathway to future-proof growth by specifying how much and how quickly they need to reduce their greenhouse gas emissions.

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