

Lancaster West Sustainability Strategy

2020-2030

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Our Vision

The vision is for Lancaster West to become a model net-zero carbon estate by 2030.

Our main objectives to help us achieve this vision are:

- Refurbishing the Lancaster West Estate and all other properties managed by LWNT to a high standard of energy performance.
- Reducing operational carbon emissions on the estate as far as possible and offsetting any remaining emissions to get to net-zero.
- Co-designing a sustainable and affordable future with residents.
- Pioneering the net-zero carbon approach for the rest of Kensington and Chelsea.

This will form part of the masterplan for the refurbishment programme.

“...the aspiration to transform the (Lancaster West) estate through the lens of sustainability can indeed provide tangible benefits for its residents, and also act as a beacon for the safe, low-carbon refurbishment.”

Sadiq Khan, Mayor of London, in a letter to James Caspell, Neighbourhood Director of Lancaster West, Dec 2019

How will we do this?

To achieve this vision, we will focus on the following priorities. These have been identified as the most efficient ways to reduce the carbon footprint of the estate, reduce costs for residents, and secure a safe and sustainable future.

Making homes energy efficient, warm and comfortable:

- **Using a fabric-first approach to ensure that homes are refurbished to a high standard of energy efficiency and thermal comfort.** Measures will include insulating walls and roofs and replacing windows and doors.
- **All properties will be upgraded to a minimum standard of EPC C, and EPC B and EnerPHit will be achieved wherever possible.** Currently, 64% of properties have an EPC C rating and 32% have a D rating.
- **Running costs for residents will be reduced.**
- **Delivering elemental improvements to properties,** including induction cookers and LED lights.
- **Smart technology will be utilised to manage energy use effectively.** This will include the installation of smart thermostats.

Switching the heating and energy we use to a clean and green supply:

- **Replacing the current district heating systems with a new low carbon heat network.** Well over half of all energy used in a property is for heating, so increasing the efficiency and sustainability of heat supply will make a big impact.
- **Exploring the use of green electricity and renewable energy** across the estate. We will assess the best solution for each property and explore use of different options including heat pumps, air pumps, and photovoltaic panels.
- **Switching properties to renewable energy providers** as and when the opportunity arises. If all the properties on the estate switched to a renewable energy source, we would save around 1,100 tonnes of carbon entering the atmosphere.
- **Using technology to increase the efficiency of energy supply,** such as through new heat interface units.

Creating a green estate with a thriving environment:

- **Reducing waste and increasing food composting and recycling** across the estate.

- **Consideration of embodied carbon in the supply chain**, making efforts to recycle old materials and appliances, and opting for low-carbon choices in the refurbishment where possible.
- **Energy efficient communal lighting.**
- **Increasing green spaces and improving the biodiversity of the estate** by creating new gardens and green spaces.
- **Encouraging electric vehicle use and active transport**, including installing electric car charging points.

Engaging residents in the co-design of their estate:

- **We will work closely with residents to deliver all our sustainability projects.**
- **Making decisions based on the wishes and needs of residents.** Resident safety and quality of life will be at the forefront of all decision-making and delivery.
- **Using resident passion, skills and knowledge and drive to deliver changes.**
- **Learning and sharing best practice with each other to secure a sustainable future.**

Workstreams

A number of workstreams are already underway and in development to drive progress against the outlined priorities and objectives of the sustainability programme. Each of these will help Lancaster West to become a net-zero estate by 2030.

A strategic approach:

Developing a clear strategy will help us to ensure progress towards the vision – for Lancaster West to become a model net-zero carbon estate by 2030. This involves:

- We have undertaken research and worked with experts to develop a coherent, ambitious, and achievable vision for Lancaster West, aligned to residents' priorities.
- We are working on defining net-zero carbon and what this means for Lancaster West and how to achieve our vision (outlined in appendix I).
- Ensuring a shared understanding of the vision with colleagues and residents and how we can work together to achieve it.

Baselining and measuring progress:

We are working with experts to capture useful data around sustainability on the estate. This will help us to:

- Baseline and measure progress towards net-zero carbon.
- Prioritise funding and resources.
- Access funds through better availability of data.

Options we are exploring include:

- CROHM - a stock assessment service by Parity Projects used by RBKC.
- EPC data - this is being used in Retrofit Accelerator's Options Appraisal.
- Desk-based studies (such as the Passive House Planning Package) alongside external consultants and the Refurb Multidisciplinary Design Team.

Maximising funding opportunities

We are exploring several different opportunities to secure external funding to help us achieve our sustainability objectives. This will free up Council funding to achieve the best possible net-zero carbon refurbishment.

Mayor's Energy Efficiency Fund (MEEF):

MEEF is an investment fund established by the GLA to support low carbon projects to help achieve London's ambition of being zero carbon city by 2050.

We are applying for funding to help us to refurbish buildings across the estate to a high standard of energy efficiency and develop a low-carbon heat network.

Heat Networks Funding (HNIP/HNDU):

BEIS are providing grant funding through the Heat Network Investment Project to support the commercialisation and construction of heat networks; and through the Heat Network Delivery Unit to support their delivery.

We are applying for funding to help us develop a low-carbon heat network, connected to the greening electricity grid and renewable energy sources. As well as reducing carbon emissions, the network will ensure lower costs for residents.

Good Growth Fund (GGF):

This is a Mayor of London initiative to support growth and community development in London.

We have applied for funding to help us to create a network of gardens across Lancaster West.

Feasibility

Alongside securing funding, we are exploring further opportunities and seeking out ways to overcome obstacles to help us achieve net-zero carbon.

Fabric-first Retrofit:

Retrofit Accelerator - a consortium of national sustainability experts (Carbon Trust, Energiesprong, and Turner and Townsend) have been employed by the GLA to deliver a 1,600 low carbon retrofit homes by 2023. As a part of this, they are carrying out an options appraisal for the Lancaster West refurbishment in terms of energy efficiency and carbon reduction.

Additional feasibility work is being done to identify options for achieving our sustainability goals through the major refurbishment, with a focus on options around how to maximise energy efficiency and thermal comfort of homes.

Treadgold Design Competition:

We entered Treadgold House into a design competition by Energiesprong and have been provided with a proposal on retrofitting the block to achieve a high energy efficiency standard. This will be presented to residents to develop a design they are happy with and feed into the refurbishment design process.

Heat Networks:

A feasibility study funded by HNDU as part of the HNIP funding bid is being carried out by Arup and will inform the design of the heat network to be developed by the M&E team as a part of the major refurbishment. This will help to ensure the heat network we create is low carbon and energy efficient, to ensure that resident bills are minimised. It is also being used to explore potential to extend the network.

Affordability:

We are working on developing a fair financial model that makes the net-zero carbon goal affordable by recouping costs for LNWT and guaranteeing a level of thermal comfort and a saving on energy bills for residents. Work under this includes:

- Seeking out best practice from others who have put them in place.
- Developing a financial model.
- Engaging with residents.

- Developing an approach to metering and billing.
- Exploring options around ownership of energy and assets.

Horizon Scanning:

We are continuing to horizon scan for further information and opportunities that will help us to achieve a cutting edge, sustainable refurbishment. This involves:

- Researching best practice in the sustainability field.
- Keeping up to date with emerging technologies and techniques.
- Attending information events.
- Following up on leads and meeting with contacts.
- Identifying opportunities for additional funding.

Delivery

We are already delivering a number of projects which are contributing towards our vision of reaching net-zero carbon by 2030.

Net-zero refurb programme:

The majority of progress towards our vision will be achieved through the planned major refurbishment of the estate. Work relating to sustainability in this programme includes:

- Ensuring refurb contractors help us to achieve our sustainability goals.
- Retrofitting homes to a minimum EPC C rating and EPC B or EnerPHit standard where possible.
- Working with residents to ensure all sustainability aspects of the refurb meet their needs and expectations, particularly regarding insulation.

Net-zero internal refurbishment project and sustainable voids:

We are making sustainable improvements to void properties, to reduce carbon consumption and running costs for their residents and to pilot technologies and techniques for the wider refurbishment. This has involved:

- Trying out different insulation products and methods.
- Installing energy efficient appliances.
- Recycling waste materials.
- Using supply chain to explore sustainable products.

Smart metering and devices:

We are identifying the best possible technology and taking opportunities to install smart meters where possible to help reduce residents' energy use and costs, and provide a means for measuring progress against our net-zero goal.

Communal areas and lighting:

We are making continuous improvements to maximise the energy efficiency of communal areas across the estate. This includes piloting new technologies. Changes that have been made include:

- Upgrading lighting to LEDs.
- Piloting new solar powered lighting.

- Trialling sensors to reduce energy usage.

Biodiversity, composting, and gardens:

We are trying out ways of making Lancaster West a greener estate. This includes:

- Installation of compost bins and encouraging composting in gardens.
- Installation of water butts and gutting for rainwater collection.
- Explore the potential of creating a beehive on the estate.
- Creating new green spaces, including gardens and meadows.

Some outcomes of this workstream include:

- Creating a greener, happier estate.
- Offsetting carbon emitted on the estate.
- Reducing food miles through growing food on the estate.
- Supporting biodiversity on the estate.

Supply chain, waste and recycling:

We are looking at how to reduce the embodied carbon in Lancaster West's entire supply chain. We are currently:

- Agreeing a waste management approach with the Property Team.
- Recycling flooring removed from voids.
- Exploring options for recycling appliances from voids and the future refurb.

Green Utilities Clinic:

We are supporting residents to switch to green energy providers and lower their bills. This will help us to green the grid and tackle fuel poverty on the estate.

Comms and Engagement

Comms:

Progress towards the zero-carbon goal is shared regularly with stakeholders, to ensure they are kept up to date and to facilitate a conversation around priorities and actions.

Current activity includes:

- Developing a strategy that ensures we provide informative, inclusive and accessible comms.
- Sharing updates via Instagram and Youtube.

Engagement:

We are working in partnership with residents to achieve a net-zero estate that meets the needs and priorities of those that live on it. We want to assure residents that their safety and comfort is the top priority whilst also taking the opportunity to secure a better future for all. This involves:

- Developing a sustainability engagement strategy which outlines our approach.
- Working with residents to understand current performance of properties and how we can improve this.
- Ensuring good understanding and engagement with sustainability as an issue and what is needed to improve sustainability on the estate.

To achieve this, we will:

- Work with a core group of interested residents to finalise the sustainability strategy, discuss ideas, and promote sustainability on the estate.
- Present and discuss the strategy with both the RA and with block reps.
- Run online webinars with experts on different key areas of sustainability.
- Run drop-in information events.
- Ensure dedicated sustainability support throughout the refurbishment.

Measuring success

Low-energy building standards

	Passivhaus standard	EnerPHit standard	PH low-energy standard	AECB standard	UK Part L1A 2013 (newbuild) approximately
Space heating/cooling demand	15 kWh/m ² /a	25 kWh/m ² /a	30 kWh/m ² /a	40 kWh/m ² /a	54 kWh/m ² /a
PE/PER demand	120 kWh/m ² /a	120 kWh/m ² /a	120 kWh/m ² /a	120 kWh/m ² /a	190 kWh/m ² /a
Airtightness (n50)	0.6 n50 l/h	1.0 n50 l/h	1.0 n50 l/h	1.5 n50 l/h	5.0 n50 l/h
Thermal bridges	0.01 W/MK	As PH standard	As PH standard	As PH standard	0.05 or 0.15 W/MK
Overheating frequency (>25C)%	10%	10%	10%	10%	Not measured

How will we track our progress?

We are working with international experts (including the GLA's Retrofit Accelerator) to model the current carbon footprint of the estate, using EPC data, consumption data and studies of the building fabric.

We will use these models as a basis for planning both the fabric upgrades to the buildings and the best design of the heat network.

To ensure we deliver our vision of becoming a net-zero carbon estate, we will regularly monitor energy usage using technology such as smart thermostats and through continuing to work with experts.

We will regularly develop estimates for energy savings and produce a readable sustainability dashboard. Each year, we will report on our estimated energy savings and whether we are on track to becoming net-zero carbon by 2030.

Appendix I – Definitions

Proposed definition of sustainability for Lancaster West:

Sustainability is a term which means a range of different things to different people. In a technical sense, sustainability refers to the capacity for the continuance of a system. However, interpretation usually involves a social understanding of the system and its outcomes.

The most commonly used definition is from a 1987 United Nations report, which describes sustainable development as development which ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’. This definition recognises that the resources we have on earth are finite, and so we should use them in a way which does not significantly deplete them over time, or result in environmental or health hazards, or other injustice.

Sustainability has three key pillars:

- Environmental – living within the means of natural resources and aspiring to net-zero carbon
- Economic – using resources efficiently and responsibly
- Social – achieving good social wellbeing

For the purpose of our strategy and sustainability workstream we are primarily focusing on environmental sustainability, but it is necessary to promote the three different types in tandem in order to achieve a truly sustainable future.

On a local level, environmental sustainability requires using resources in a way which doesn’t deplete them, doesn’t cause significant pollution or other environmental issues, and positively contributes towards a better future for both humans and biodiversity. Sustainable practice thinks in the long-term and supports ecological, human, and economic health and vitality.

A key part of this is reducing carbon emissions and tackling climate change, but this is just one aspect of sustainability. Other aspects are improving air quality, increasing biodiversity, tackling fuel poverty, and minimising waste.

Proposed definition of net-zero carbon for Lancaster West:

To achieve net-zero carbon in 2030, the operational energy on Lancaster West Estate in the year 2030 should emit zero carbon on balance, once accounting for carbon removed from the atmosphere by appropriate offsetting on and offsite.

The primary focus to achieve this should be on improving the energy efficiency of buildings on the estate so that their energy demand is minimised.

Lancaster West should aim to meet net-zero carbon based on actual energy usage, so encouraging behaviour that will minimise energy demand should also be a key priority.

It is not necessary that all energy is supplied from renewable energy sources. However, the use of renewable sources of energy should be prioritised over fossil fuels to minimise the amount of carbon emitted through the production of energy.

Effort should be taken to minimise the embodied carbon of the estate and emissions from the refurbishment project itself, and to ensure that materials can be recycled or repurposed in future to reduce whole-life carbon as much as possible. Though ambitious, it may also be possible to achieve whole-life net-zero carbon through this and with additional offsetting.

Rationale:

Definitions of net-zero carbon typically refer to a balance between the amount of carbon a building or operation emits and the amount of carbon it eliminates from the atmosphere, so that the overall net carbon emissions as a result of energy use sits at zero over a period of one year. Some of these explicitly emphasise the reduction of emissions as the main priority in achieving this. This proposal is therefore in line with general consensus around what net-zero means and how it should be achieved.

The Committee on Climate Change defines net-zero as a 'deep reductions in emissions of greenhouse gases, with any remaining sources offset by removals of CO₂ from the atmosphere. Net emissions, after accounting for removals, must be reduced by 100%, to zero'¹.

The Grantham Institute defines net-zero as an 'overall balance between emissions produced and emissions taken out of the atmosphere'; with residual emissions allowed as long as they are offset by removing emissions using natural and engineered sinks.²

Priorities:

1. Investing in energy efficiency of buildings and demand reduction, so that the amount of energy used in operations and carbon consequently emitted, is minimised.
2. Prioritisation of the use of renewable energy sources over fossil fuels to reduce the amount of carbon emitted through the production of energy.
3. The use of allowable solutions to offset remaining carbon emissions.

These are in order of priority. It is most cost-effective and sustainable to first increase energy efficiency. Offsets should only be used after attempt has been taken to reduce the carbon emission from a building and may be phased out in future.

This is in line with work by the Zero Carbon Hub which defines three core requirements for a home to qualify as net-zero carbon:

1. Fabric performance must at a minimum comply with the Fabric Energy Efficiency Standard.
 - Proposed Fabric Energy Efficiency Standard is 39kWh/m²/year for apartment blocks/mid-terrace homes and 46kWh/m²/year for end of terrace, semi-detached, and detached.
2. Any CO₂ emissions that remain after consideration of heating, fixed lighting, and ventilation, must be less than or equal to the Carbon Compliance Limit.
 - Proposed Carbon Compliance Limits are 10kgCO₂(eq)/m²/year for detached homes, 11kgCO₂(eq)/m²/year for attached, 14kgCO₂(eq)/m²/year for low rise apartment blocks.
3. Any remaining CO₂ emissions from regulated energy sources must be reduced to zero
 - This can be met by overperforming on the first 2 requirements or investing in allowable solutions.³

For an estate to be net-zero carbon, this would mean that the carbon emitted from supplying energy on the estate must be minimised as far as possible, and remaining emissions should be offset.

¹ <https://www.fgould.com/uk-europe/articles/achieving-a-carbon-net-zero-estate/>

² Grantham Institute - <http://www.lse.ac.uk/GranthamInstitute/news/what-is-net-zero/>

³ Zero Carbon Hub - <http://www.zerocarbonhub.org/zero-carbon-policy/zero-carbon-policy>

Scope:

It is necessary for us to define the scope of what we mean by net-zero carbon – whether this is operational carbon, includes carbon emissions for construction, or if the scope is whole-life carbon.

The Green Building Council defines these as:

- Net zero carbon – construction: ‘when the amount of carbon emissions associated with a building’s product and construction stages up to practical completion is zero or negative, through the use of offsets or the net export of onsite renewable energy’.
 - The boundary is defined as all areas included in the whole life carbon assessment that have been reported and offset at practical completion; should apply to whole developments.
- 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’.
 - The boundary is defined as all areas under operational control or influence where a net zero carbon balance has been achieved on an annual basis, so can apply to multi-building developments.
- 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’.⁴

Most definitions just refer to operational carbon emissions, and at present it is unfeasible to expect to achieve whole-life net-zero carbon, but this could change in future.

Relationship with other terms:

- ‘Zero carbon’ means that a building can generate its own energy from renewable resources sufficient to sustain the energy demands of the dwelling.
- ‘Net-zero carbon’ and ‘carbon neutral’ can be used interchangeably as both refer to a balance in the amount of carbon emitted and the amount of carbon offset from a building or operation.
- It is important to distinguish between ‘net-zero carbon’ and ‘net-zero’ as the latter could refer to zero net emissions of all greenhouse gases, or all long-lived greenhouse gases. Including all greenhouse gases in a single target raises significant problems for measurement as they all have different global warming potentials and atmospheric lifetimes.

Measuring carbon:

Energy consumption should be calculated on an annual basis, so for the estate to achieve net-zero carbon by 2030, it would need to have removed as much carbon from the atmosphere as it had emitted over the space of the year.

Carbon impacts should be recorded as a total (tCO₂e) and in terms of intensity (kgCO₂e/m²).

Most methods of calculating carbon emissions from a building rely on modelled energy performance (based on assumptions about average energy use), rather than requiring individual homes to measure and disclose their energy use. UK Government policy doesn’t account for performance gaps when measuring carbon emissions.

However, the proposed definition of net-zero could be expanded to include unregulated energy in future (consumption from appliances). There is a consultation planned this year around the introduction of mandatory ‘in-

⁴ Green Building Council - <https://www.ukgbc.org/wp-content/uploads/2019/04/Net-Zero-Carbon-Buildings-A-framework-definition.pdf>

use' energy performance readings for all business buildings and the Green Building Council proposes that energy consumption from appliances should be measured in domestic buildings too⁵.

- MHCLG takes account of:
 - Emissions from space heating, ventilation, hot water, and fixed lighting
 - Expected use from appliances
 - Exports and imports of energy from development (and directly connected energy installations) to and from centralised energy networks
- Green Building Council proposes that the net-zero definition should have a broader scope, including:
 - Cooking
 - Plug-in appliances
- Zero Carbon Trust includes:
 - Space heating and cooling
 - Hot water
 - Fixed lighting (so this will include street lighting)
- They do not include:
 - Cooking
 - Plug-in appliances
 - Embodied carbon and material choices
 - Carbon emissions from construction
 - Transport (including electric vehicle charging)

Offsetting:

Offsets should only be used when all feasible measures for reducing carbon impacts have been reasonably exhausted (so energy efficiency and renewable energy production should be prioritised), and all offsetting should be delivered onsite to make a genuine contribution to Lancaster West's carbon emission balance.

UK Government removed its policy around allowable solutions and does not provide a framework for offsetting. It is a controversial subject and there are significant issues related to transparency and effectiveness.

Offsets may include:

- Onsite measures (this could include tree planting or habitat restoration)
- Connected measures (such as through providing renewable energy to nearby buildings)
- Offsite actions
- Payment to a fund investing in abatement projects (this could include tree planting, projects encouraging shifts to low emission vehicles, supporting heat networks elsewhere)
- Direct air capture and carbon storage

Key requirements for an offset to be appropriate:

- Accurate measure of emissions to be offset
- Accurate measure of carbon that is being saved elsewhere
- Additionality (evidencing that the scheme/action wouldn't have been done otherwise).

⁵ Green Building Council - <https://www.ukgbc.org/wp-content/uploads/2019/04/Net-Zero-Carbon-Buildings-A-framework-definition.pdf>

Proposed measurements:

- Total annual energy consumption (kWh)
- Total annual electricity consumption (kWh)
- Total annual fuel consumption per fuel type (kWh)
- Total annual electricity generated by renewable sources minus storage losses (kWh)
- Amount and type of offsets procured
- Total annual indirect CO₂ emissions from imported energy (tCO₂)
- Total annual direct CO₂ emissions from combustion of fuel per fuel type (tCO₂)
- Total annual indirect CO₂ emissions from combustion of fuel per fuel type (tCO₂)
- Total annual displaced CO₂ emissions from electricity generated by onsite renewable energy sources minus storage losses (tCO₂)
- Total annual displaced CO₂ emissions from offsets (tCO₂)
- Fabric Energy Efficiency (kWh/m²/year)