

Environmental Standards Statement

1A Delamere Rd

February 2021

Proposed sustainable residential development of 9no. dwellings
on land north of Delamere Rd, Levenshulme.

**Talo
North.**

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1.0 Introduction

The proposal is a sustainable, new build, residential development on an under-utilised plot of soon to be brownfield land in a key strategic location in the district centre of Levenshulme, Manchester.

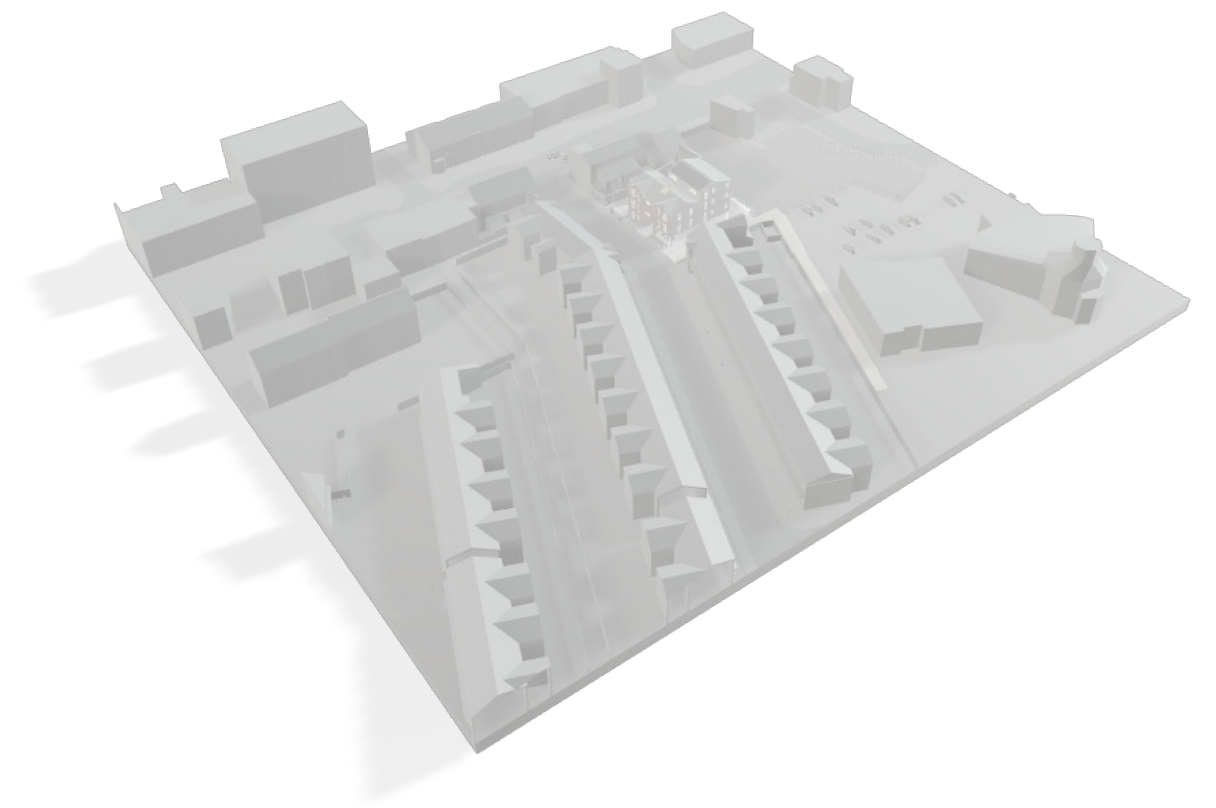
The proposal is consistent with Manchester City Council's Core Strategy Policy H6 where an appropriate placement of high density is encouraged. The site falls under South Manchester Strategic Regeneration Framework, identifying it as a location that could **"increase development around the railway station"** which is within a 5 min walk from the site.

'SK Transport Planning' identifies this site as being very well connected to public transport, as well connected as some city centre sites, scoring 7/8 GMAL. For this reason 'Cushman & Wakefield' have identified this site as an appropriate location for a higher density residential development that will reduce dependency on an already congested road system with predominantly single occupancy car users, by far the most prominent form of transport in the city.

"unless developments of a higher density are supported on sustainable sites, single occupancy car use will be exacerbated within Levenshulme"

Talo North Ltd is committed to delivering a sustainable development, in fabric and in use, that incorporates a range of sustainable, alternative technologies and renewable or low impact materials. Adopted by Manchester City Council in March 2020 the City has a target of **"all new development needing to be zero carbon from 2023 at the latest, when the new Manchester Local Plan is expected to become operational."**

The residential development that Talo North Ltd proposes is beyond current MCC Planning Policy, very likely the first zero carbon residential development in the City. If the commitments by MCC are to be upheld, we ask that a forward thinking, zero carbon development like this is to be supported and celebrated.



2.0 UK / Manchester Sustainability

Manchester Local Plan

‘...we want any future growth to support our ambition to be a zero-carbon city by 2038 or before.’

Manchester Climate Change Framework 2020-25

‘This should include applying zero carbon standards to all developments where the Council has additional influence, for example as a client / end-user, landowner or development partner, with a view to all new development needing to be zero carbon from 2023 at the latest, when the new Manchester Local Plan is expected to become operational’

Section 19(1A) of the Planning and Compulsory Purchase Act 2004 requires local planning authorities to include in their Local Plans “policies designed to secure that the development and use of land in the local planning authority’s area contribute to the mitigation of, and adaptation to, climate change”. This will be a consideration when a Local Plan is examined.

The Climate Change Act 2008 establishes a legally binding target to reduce the UK’s greenhouse gas emissions by at least 80% in 2050 from 1990 levels. To drive progress and set the UK on a pathway towards this target, the Act introduced a system of carbon budgets including a target that the annual equivalent of the carbon budget for the period including 2020 is at least 34% lower than 1990.

In April 2019, UKGBC published ‘Net Zero Carbon Buildings: A Framework Definition’ which provides the property and construction sector with clarity on the outcomes required for a net zero carbon building.

As a freely available resource, the framework is intended to be used by building developers, designers, owners, occupiers and policy makers to inform the development of building tools, policies and practices that increase the uptake of net zero carbon buildings.

MCC looks likely to adopt this UKGBC policy to address Manchester’s ambitions to achieve zero carbon targets in the built environment.

Talo North Ltd proposes not only addressing emissions from energy usage but also embedded or ‘scope 3’ emissions through the use of reclaimed materials and hempcrete wall build-up, a carbon negative material.

UKGBC initiative includes embodied energy regarding the materials used in construction. A drastic change to what is currently being built is needed, if this is to be achieved. Talo North Ltd’s proposed construction method will address this.



3.0 Sustainable Design

Following the principles of the UKGBC zero carbon plan, Talo North Ltd proposes using passive solar gain, utilising reclaimed materials, low carbon/carbon negative materials, minimising energy usage and super insulating to achieve a zero carbon development. Orientation and the use of large scale glazing will passively heat the building. Diurnal temperature gains from this heat gain are tempered though the use of the high thermal mass of the Hempcrete wall build up. Please see page.10 for more detail on the benefits of hempcrete construction. The walls slowly store and release heat from the mass of the walls into the living space, heating throughout the day and releasing slowly over the evening.

Natural ventilation is utilised to further reduce energy usage with all apartments benefitting from cross ventilation to avoid the possibility of overheating. Another way this development reduces energy usage is the use of glazing. Daylighting studies have shown there will be a reduced need for powered lighting needed during daylight hours. (See IMG. 2)

Reclaimed materials have reduced embodied carbon over the use of brand new materials. This prolongs the useful life of building materials in the state they were made in, avoiding downcycling and losing the benefits of re-use. Transport carbon emissions will be factored in when choosing the location of the materials to be used, but this is minimal compared to comparative emissions from manufacturing new materials.

Another feature of the UKGBC concept that Talo North Ltd is using is that of energy storage. The use of batteries for storage of electricity is prohibitively expensive for a development of this scale. The same concept has been applied through the use of crossover technology, using the hot water storage as a form of energy storage. The hot water tanks will be heated using excess on-site electricity generation during daylight hours. The energy from the 9kw array of Solar PV panels on the roof will heat water for use in the apartments, saving energy that would have otherwise come from the grid. This also takes advantage of energy produced during the day, that would otherwise be either sold back to the grid, with a percentage being lost in transmission (between 5.7% - 8.7%).

Through the use of the various aforementioned Sustainable Design techniques this development will be future proofed from rising energy costs, mitigating the devastating effects of fuel poverty.



4.0 100% Renewable Supply

The electricity supply is proposed 100% renewable energy supplied by Ecotricity. Ecotricity supplies 100% green electricity and re-invests profits into energy production infrastructure. This ensures continued reduction in costs due to enhanced production and a gradual improvement of the National Grid through sustained investment.

Ecotricity will be the sole supplier of electricity at the development ensuring 100% renewable energy supply to the x9 apartments. This renewable electricity supply will make up the shortfall from the 9kw solar PV array. Other on-site production was tested but is not viable so this renewable energy supply ensures energy used on site is always from a reliable renewable resource.

According to UKGBC 'Net Zero Operational Carbon' we have maximised all available suitable roof space for energy production and all other avenues for on-site production aren't viable for this particular site.

One feature that you can see in more detail on Pg. 7 of this document is the energy storage system that is proposed. This ensures as much energy is produced but also stored and used on site. This minimises loss during transmission when moving from the production point and back into the grid.

Since the building is proposed to be build-to-rent, management of the electricity supply is a consideration in the decision to allocate just one supplier to the building. This avoids confusing bills between residential units having different suppliers. To achieve 'zero carbon' supply is consistently supplied to this development ensuring this cannot change in the future rendering the development more carbon intensive through it's energy supply coming from non-renewable sources.

<https://www.ecotricity.co.uk/our-green-energy/our-fuel-mix>

ecotricity



5.0 Sustainable Technology

The potential sustainable technologies to be used at 1A Delamere Rd were explored early during the design development stage. As renewable micro generation was part of the UKGBC advice the to be able to achieve a Zero Carbon development, space was allocated for this. A holistic approach was taken and the system specified makes best use of the space available and the most efficient use of the power generated on site. Site constraints obviously discount many technologies for lack of space and the fact the site is in a built up residential area. The following technologies were considered during the design process.

Combined Heat and Power

Due to space constraints, it being a relatively new technology and prohibitive cost for a project of this scale CHP was not used. Due to the levels of insulation specified, the heat demand is forecasted to be less than that needed to justify a system such as CHP to deliver its space heating demand.

Wind Power

The local wind speed of 4.2m/s² is considered unviable to make best use of a technology such as a small scale wind turbine. Due to the built up nature of the site, surrounded by residential properties this would not make best use of the investment in a turbine to supply the sites electricity demand. Planning consent would also need to be approved which would be highly unlikely in such a built up area.

Air Source Heat Pumps

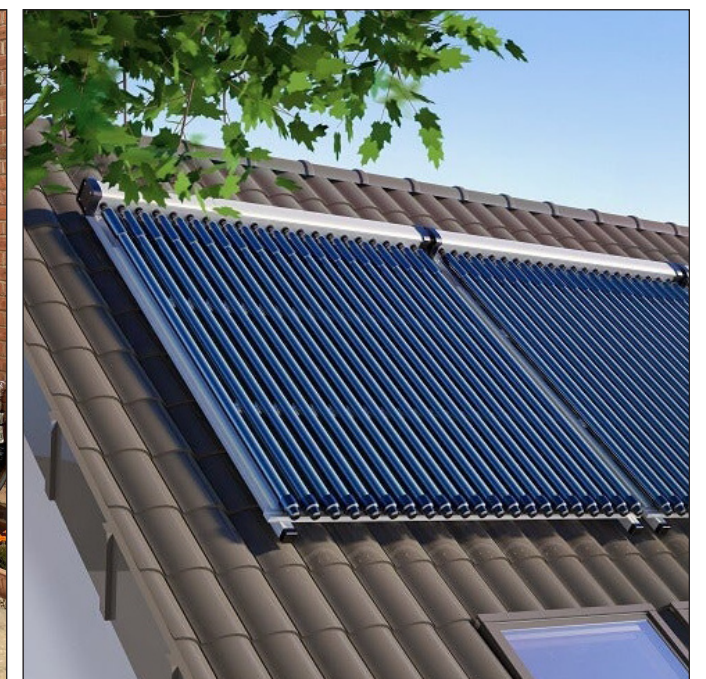
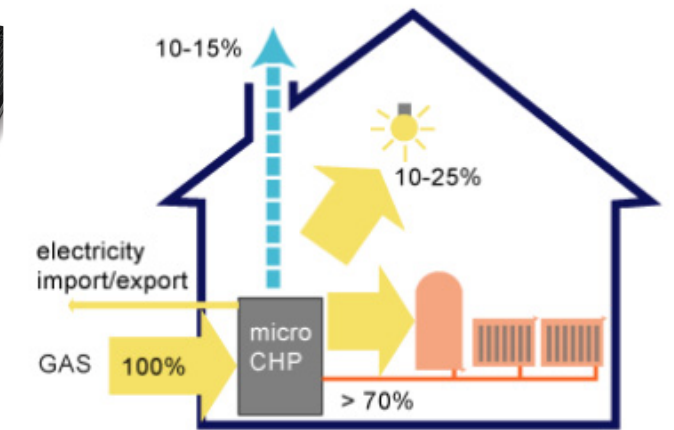
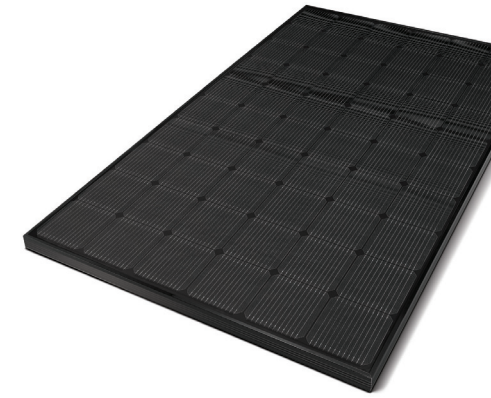
These were a consideration for 1A Delamere Rd but after in depth analysis of the plan, it was very difficult to find a place for the unit for each apartment without unduly affecting the streetscene. Some of the units would have been visible. A centralised version was tested but also found to be unviable due to space constraints on site. Ground Source heat pumps were investigated but not economically viable for a development of this size, it would not make best use of that technology for this project.

Solar Thermal

Excess energy from solar thermal is often dealt with using a heat sink. This energy is not utilised and cannot be moved effectively or converted into other types of energy easily. This would only provide pre-heating for the hot water system. This was seen as a waste of the South facing usable roof space that could be otherwise used for Solar PV.

Solar PV & Dynamic Energy Storage

After detailed investigation into all of the above technologies Solar PV & Dynamic Energy Storage was found to be the most effective use of renewable micro generation energy that was available. This is detailed on the following page.



6.0 Demand for energy

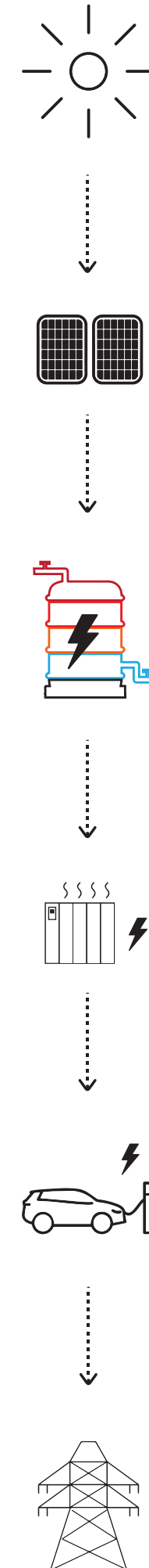
Following UKGBC guidance, on-site energy micro generation is to be utilised in the form of an array of 9kw Solar PV panels. This power will go directly to heating the unvented hot water tanks for each apartment. The 'unvented hot water tanks' act as batteries heating up and storing energy in the form of hot water during the day to be used when there is more demand in the evening. Once demand is fulfilled with heating the hot water tanks the energy will be diverted to a circuit that feeds electric space heaters in each apartment.

These space heaters fed by the power from the Solar PV array is another form of short term energy storage. Due to the high levels of insulation and air tightness from the use of Hempcrete, this ensures this heat isn't lost immediately. The high heat storage capacity of the Hempcrete stores this heat in the form of thermal mass and slowly releases it ensuring best use of the energy.

If there is no demand or demand is fulfilled with the electric space heaters the energy will be diverted to the x3 electric car parking bays. This is another form of longer term energy storage and will utilise the presence of batteries that already exist in the cars instead of having dedicated battery storage on site, thus doubling up on the same technology in the same location. This is something that would be financially unviable and also impractical with the space needed for large batteries and associated plant.

This system is similar to a battery storage system but more economical. Energy generated on-site is stored in the form of hot water, used in the form of space heating in the apartments, stored using the batteries of the electric cars and only exported to the grid if all these points of energy demand are satisfied. The exporting of energy to the grid is inefficient and therefore represents a significant loss of useful energy during transmission. Loss through transmission can be as much as 5.7%.

Demand is reduced at 1A Delamere Rd by proposed use of LED lighting throughout the scheme, common space lighting utilising motions sensors, high levels of insulation to reduce heating demand, high levels of glazing to reduce lighting demand, on site micro generation of electricity via 9kw array of Solar PV panels and natural cross-ventilation to reduce demand on powered extractor fans.



7.0 Sustainable Transport

The proposed development is located in an area with excellent provision and access to public transport. SK Transport Planning were instructed to carry out a report on public transport provision and noted the following.

Demand for parking of only 34% in this type of accommodation and a very high GMAL score of 7/8 showing excellent provision of public transport close to the site.

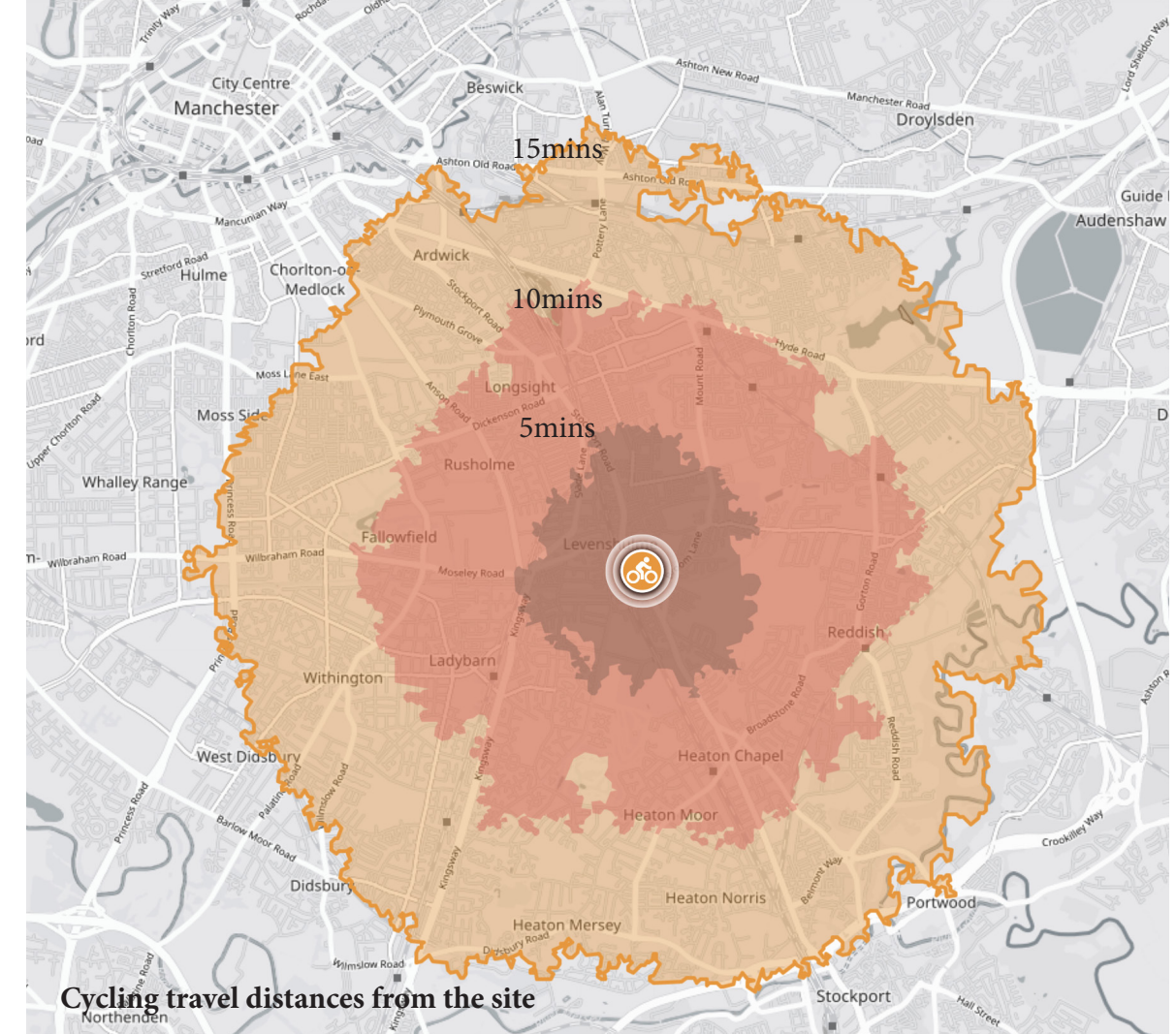
- Car ownership for apartment residents in Levenshulme is 34%
- GMAL score 7 out of possible 8 showing excellent provision of public transport
 - this includes access to bus routes 150, 171, 172, 179, 197, 191, 192, X92 at a distance of metres from the site, less than 5min walking distance.
 - less than 5min walk to train services to Manchester & Stockport.
- The proposal includes 10 secure sheltered bicycle parking spaces
- Fallowfield Loop is less than 2min by bike connecting Levenshulme to the City Centre 'off-road' and as far as Chorlton.

The London Authorities have the most experience of successfully delivering low car housing across suitable areas of Greater London. The draft London Plan (policy T6) states that low-car development should be the starting point for all new development that is well connected by public transport and that sites with a PTAL of between 5-6 are suitable. A London PTAL of 5-6 is the equivalent of a Manchester GMAL of 7-8.

Manchester is experiencing City Centre growth that is unprecedented. If the clear trend of inhabitants living in the City Centre and moving out to District Centres after 5-10years continues, then District Centres will see a huge surge in demand for housing. Supporting appropriate dense development around sustainable transport hubs will in the longer term reduce pressure on existing road infrastructure, increasing intensity of population numbers around these hubs subsequently reducing demand on road networks.

Cycle storage provision is above the minimum demanded by MCC guidelines, 10 secure cycle spaces for 9 apartments.

x3 Electric car parking bays are proposed for the parking area. UK policy dictates that by 2030 all new car sales will be electric cars. This parking provision preempts that move toward electric cars and avoids unnecessary and disruptive retrofit work in the future.



8.0 Insulation

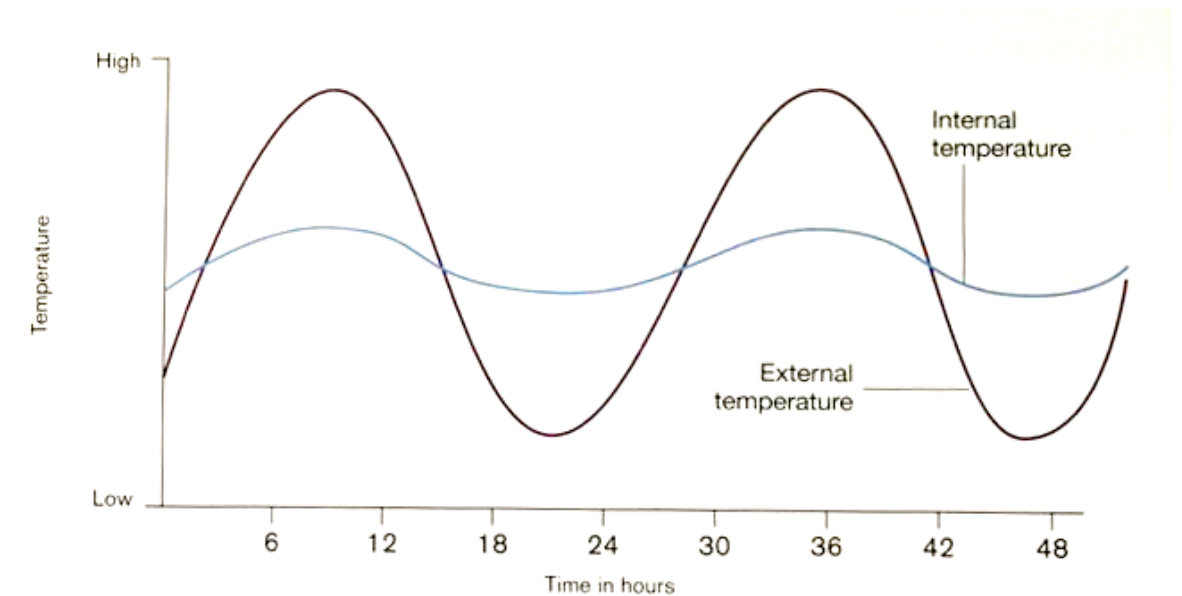
Hempcrete is a composite material made from wet-mixing hemp shiv with a lime binder. Hempcrete provides a natural, vapour-permeable, airtight insulation material which also has great thermal mass, giving it a uniquely effective thermal performance. Using Hempcrete in buildings creates healthy (chemical-free and damp-free) indoor environments. It is a “better-than-zero-carbon material”, locking away more atmospheric carbon for the lifetime of the building than was emitted during its construction.

At 1A Delamere Rd Hempcrete is used to form walls, in combination with a timber structural frame. The 360mm walls have a thermal performance that achieves U Values of 0.17 W/m²K. This gives an annual space heating demand that is less than 15kWh/m²/yr, this is in line with the UKGBC figures for reducing energy demand to adhere to a Net Zero Carbon Building.

Hempcrete also provides thermal mass, as well as insulation, due to density of the lime binder once it has set. This means that hempcrete is able to store heat within the fabric of the material itself (like a giant storage heater). In this respect it is unlike lightweight insulations which only store heat within the air trapped inside the material. The ability of hempcrete to store heat in this way as well as insulating has two important advantages.

Firstly, it allows for natural ventilation of the building. Whereas modern highly insulated buildings rely on airtightness alone to trap the air within the lightweight insulation layer (leading to the use of closed windows – to preserve the heat – with trickle vents and mechanical heat recovery systems to ensure indoor air quality). Hempcrete stores heat (from the sun, or from internal heating) in the thermal mass of its walls, to be released slowly throughout the night.

Secondly the slow speed at which a typical hempcrete wall stores and releases heat has the effect of “buffering” natural changes in internal and external temperatures, e.g. night and day diurnal temperature fluctuations, so the building will function very well thermally with little heating or cooling. A constant internal temperature will be maintained. This means the building keeps warm in Winter and cool in Summer. This leads to a dramatic reduction in energy bills and improvement of the internal environment for occupants.



9.0 Embodied carbon / Reclaimed materials

Although the majority of emissions from the proposed building come from the use of the building, throughout its lifetime, the embodied carbon in the materials to build it will not be ignored. Through insulating and detailing appropriately this mitigates heat loss and improves airtightness, lowering the amount of carbon expended through space heating. A hidden source of carbon in buildings is the embodied carbon in materials. Hempcrete, the most common material used in the proposed construction is carbon negative. The timber frame used for the primary structure is rapidly renewable and responsibly sourced.

The primary facade is built from reclaimed bricks. This reduces the carbon emissions used dramatically. The carbon to transport these materials to site is significantly less than sourcing brand new bricks that are newly fired. Depending on building type, by the time a building is occupied somewhere between 30% and 70% of its lifetime carbon may already have been accounted for.

<https://www.ukgbc.org/sites/default/files/Tackling%20embodied%20carbon%20in%20buildings.pdf>

The cladding for the rest of the building is reclaimed Welsh slate that is a very common vernacular material in Manchester and the surrounding areas. This will be sourced as close to site as possible from a reclamation specialist. This will ensure the minimum possible amount of carbon is emitted through the sourcing of this material. The same goes for the roofing finish, this will be locally sourced reclaimed Welsh slate.

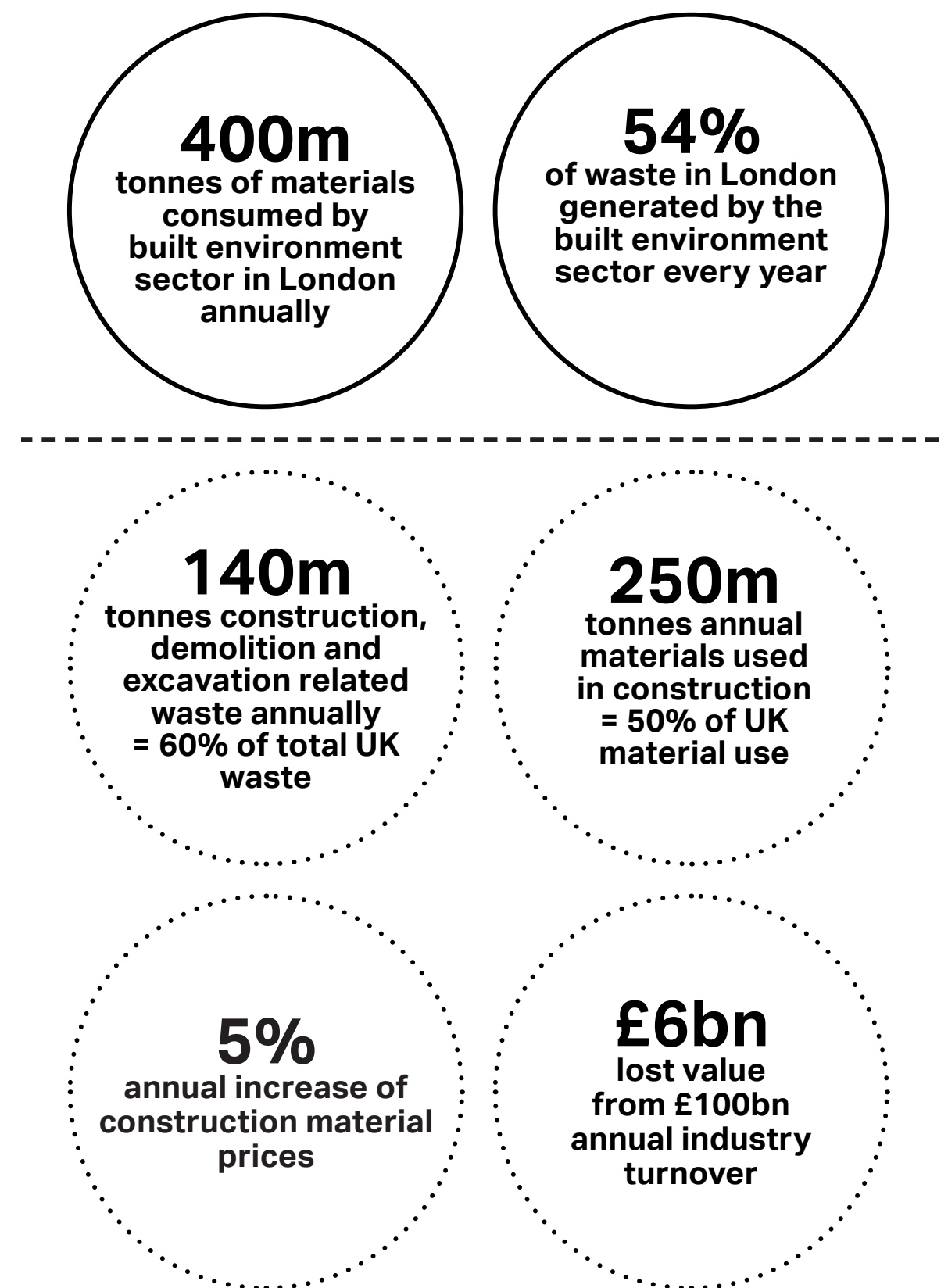
The Hempcrete wall build up is finished internally with Lime plaster. This negates the need for plasterboard like in a traditional wall build up, further reducing carbon intensive materials. Associated carbon emissions with use of plasterboard is 2.45 kg CO2 per m2. <https://gypsumtogypsum.org/wp-content/uploads/2016/01/GTOG-action-C1-1-Life-cycle-gypsum-GHG-emissions-1.pdf>

The hardstanding, parking area and all landscaping within the amenity space is finished in reclaimed 900x600mm concrete pavers, like those found on the pavement in front of the proposed development. They are differentiated from the pavement by way of a more considered bonding. Again, these are an ubiquitous material that are economical and readily available at a short distance from the site, further reducing embodied carbon.

Proposed flooring is Forbo Marmoleum flooring in kitchens and bathrooms. This is a carbon neutral material natural flooring product consisting of linseed oil, pine resin, wood flour, limestone, pigments and jute. This is a product generally used in Hospitals so is very hardwearing, ensuring an appropriately long life cycle before needing to be replaced.

Wherever possible, in line with the Talo North Ltd commitment to making a Zero Carbon development, internal fitout will utilise rapidly renewable materials, low embodied carbon materials or reclaimed materials wherever possible.

A Circular Economy is defined in draft London Plan Policy SI7 'Reducing waste and supporting the Circular Economy1' as one where materials are retained in use at their highest value for as long as possible and are then reused or recycled, leaving a minimum of residual waste. This policy has been used to inform the strategy behind the choice to specify the re-use of materials or the use of easily recyclable or re-usable building materials at 1A Delamere Rd.



EXAMPLES OF CONSTRUCTION WASTE IN THE UNITED KINGDOM

10.0 Conclusion

Talo North Ltd has set out in this document commitments to a very different proposal to the status quo. Through the use of a carbon negative material we propose a building that will have the least possible impact on the environment. This is achieved through the use of reclaimed materials, dynamic energy use & storage and renewable technology.

Carbon reduction targets are set nationally and locally and supporting a radically different proposal will be a step toward fulfilling these targets. This is not to say that this radically different proposal will stand out as something different. Through the use of reclaimed materials, as can be seen by the visualisations shown earlier in this document this proposed development will sit well in the streetscape by utilising the very same materials the adjacent buildings are made from.

Notwithstanding the size of the site; 0.05hectares, on-site energy production has still been achieved. A 9kw Solar PV array is to be used alongside a 100% renewable energy supply provided by Ecotricity. This ensures all demand is met by a sustainable, renewable energy source if not produced on-site then produced at windfarms or solar farms elsewhere. Alongside the high levels of insulation and thermal mass this will ensure a comfortable and sustainable proposal.

The location of the proposed development is very close to the A6 corridor connecting Manchester and Stockport via bus, train, bike or car. District centres such as Levenshulme that are well connected (site GMAL 7/8) and based near to sustainable transport hubs, such as Levenshulme Train station provide opportunity for density of accomodation. If this is not achieved, unsustainable transport methods such as 'one occupant car use' and the traffic congestion it brings will be exacerbated throughout Greater Manchester. The facilities provided by Talo North Ltd at 1A Delamere propose to, albeit on a small scale, help toward a city wide and nationwide transition to a more sustainable future.

Talo North.

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Appendices

Net Zero Operational Carbon

Ten key requirements for new buildings

By 2030 all new buildings must operate at net zero to meet our climate change targets. This means that by 2025 all new buildings will need to be designed to meet these targets. This page sets out the approach to operational carbon that will be necessary to deliver zero carbon buildings. For more information about any of these requirements and how to meet them, please refer to the: UKGBC - Net Zero Carbon Buildings Framework; BBP - Design for Performance initiative; RIBA - 2030 Climate Challenge; GHA - Net Zero Housing Project Map; CIBSE - Climate Action Plan; and, LETI - Climate Emergency Design Guide.

Low energy use

- 1 Total Energy Use Intensity (EUI) - Energy use measured at the meter should be equal to or less than:

- **35 kWh/m²/yr** (GIA) for residential¹

For non-domestic buildings a minimum DEC B (40) rating should be achieved and/or an EUI equal or less than:

- **65 kWh/m²/yr** (GIA) for schools¹
- **70 kWh/m²/yr** (NLA) or **55 kWh/m²/yr** (GIA) for commercial offices^{1,2}

- 2 Building fabric is very important therefore space heating demand should be less than **15 kWh/m²/yr** for all building types.

Measurement and verification

- 3 Annual energy use and renewable energy generation on-site must be reported and independently verified in-use each year for the first 5 years. This can be done on an aggregated and anonymised basis for residential buildings.

Reducing construction impacts

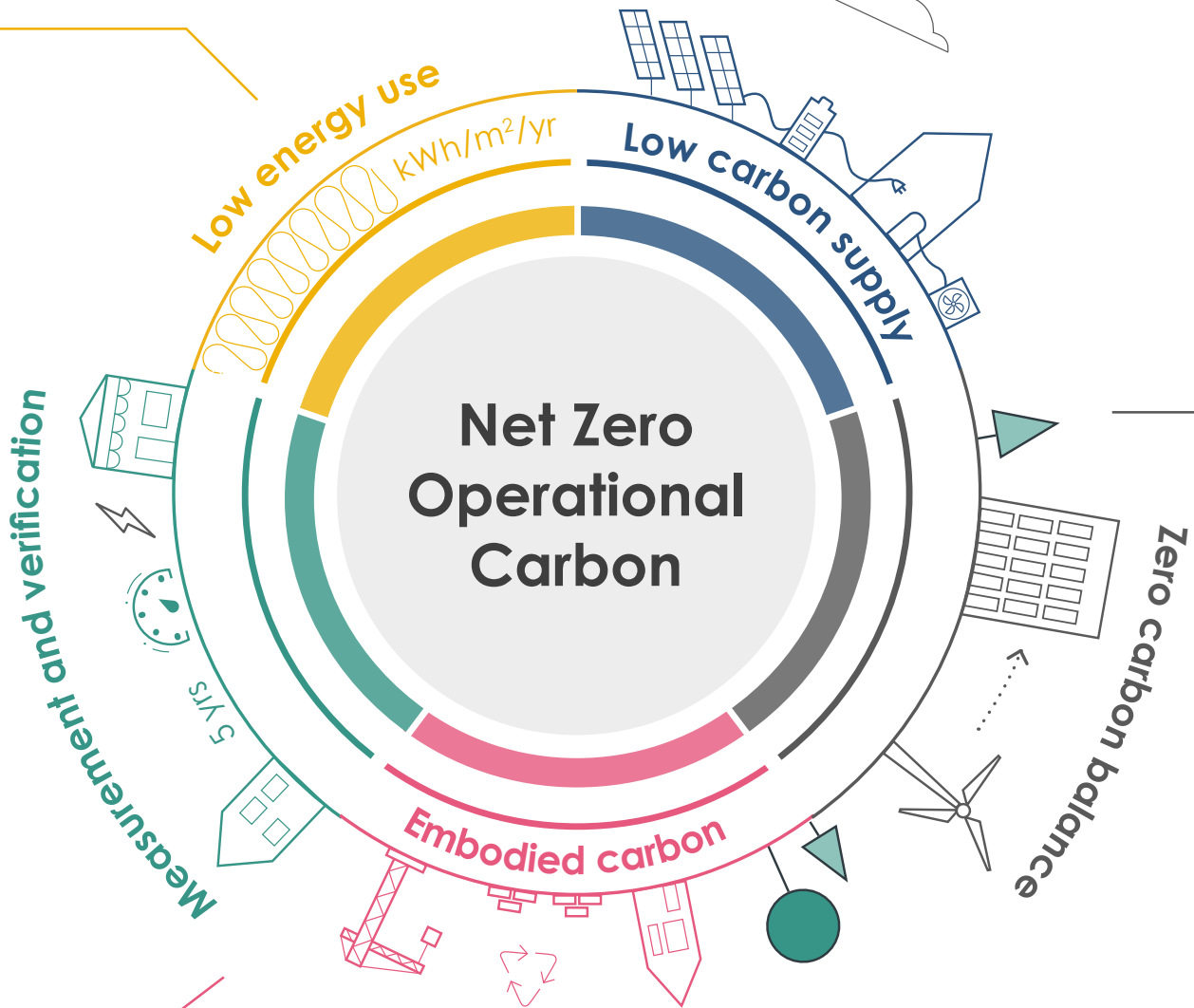
- 4 Embodied carbon should be assessed, reduced and verified post-construction.³

Low carbon energy supply

- 5 **Heating and hot water should not be generated using fossil fuels.**
- 6 The average annual carbon content of the heat supplied (gCO₂/kWh) should be reported.
- 7 On-site renewable electricity should be maximised.
- 8 Energy demand response and storage measures should be incorporated and the building annual peak energy demand should be reported.

Zero carbon balance

- 9 A carbon balance calculation (on an annual basis) should be undertaken and it should be demonstrated that the building achieves a net zero carbon balance.
- 10 Any energy use not met by on-site renewables should be met by an investment into additional renewable energy capacity off-site OR a minimum 15 year renewable energy power purchase agreement (PPA). A green tariff is not robust enough and does not provide 'additional' renewables.



Notes:

Note 1 – Energy use intensity (EUI) targets
The above targets include all energy uses in the building (regulated and unregulated) as measured at the meter and exclude on-site generation. They have been derived from: predicted energy use modelling for best practice; a review of the best performing buildings in the UK; and a preliminary assessment of the renewable energy supply for UK buildings. They are likely to be revised as more knowledge is available in these three fields. As heating and hot water is not generated by fossil fuels, this assumes an all electric building until other zero carbon fuels exist, (kWh targets are the same as kWh_{elec}). Once other zero carbon heating fuels are available this metric will be adapted.

Note 2 – Commercial offices
With a typical net to gross ratio, 70 kWh/m² NLA/yr is equivalent to 55 kWh/m² GIA/yr. Building owners and developers are recommended to target a base building rating of 6 stars using the BBP's Design for Performance process based on NABERS.

Note 3 – Whole life carbon
It is recognised that operational emissions represent only one aspect of net zero carbon in new buildings. Reducing whole life carbon is crucial and will be covered in separate guidance.

Note 4 – Adaptation to climate change
Net zero carbon buildings should also be adapted to climate change. It is essential that the risk of overheating is managed and that cooling is minimised.

Developed in collaboration with:



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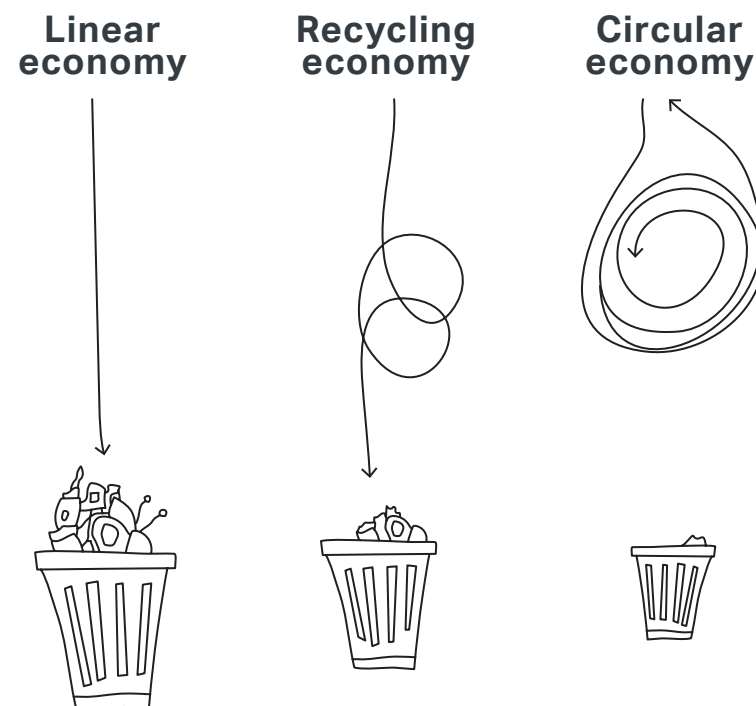


CIRCULAR ECONOMY IN THE BUILT ENVIRONMENT

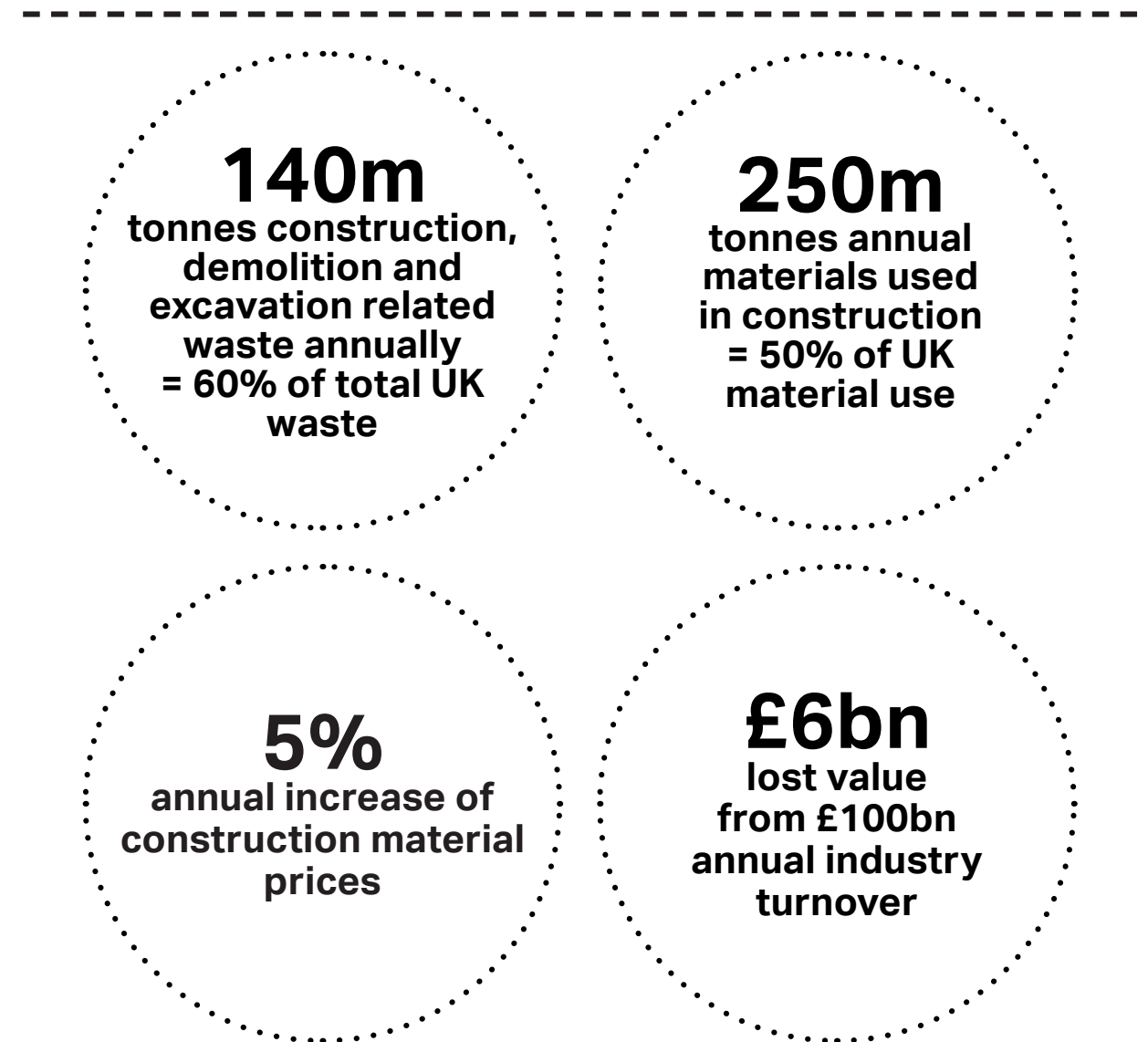
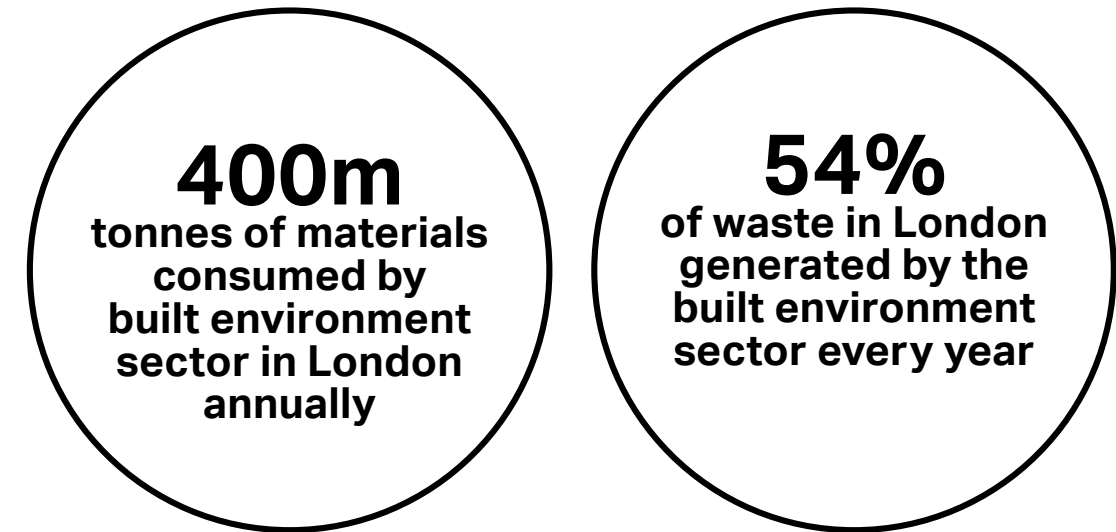
The impacts of our current linear economic model include man-made climate change, resource depletion, deforestation, loss of biodiversity, and pollution of land, air, rivers and oceans.

As the largest user of materials and generator of waste in the economy, the built environment sector must take a lead in supporting the shift towards a circular economy. In London, the sector consumes 400 million tonnes of material each year and accounts for 54% of waste. Extending the life of buildings and recovering and reusing materials at the end of their life can help reduce the demand for virgin materials and waste arising from the built environment.

It can also help protect the sector and the city against the rising cost of materials and disposal of waste, as well as the impact of demolition and waste on air and noise quality, congestion, land take.



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EXAMPLES OF CONSTRUCTION WASTE IN THE UNITED KINGDOM

stage, in particular in the building structure. If opportunities are not taken at this early stage, the embodied carbon savings are lost for the entire lifetime of the building.

The below (purely for illustration) provides an idea of the potential breakdown of carbon impacts at each stage of a building's lifetime, for different building types.

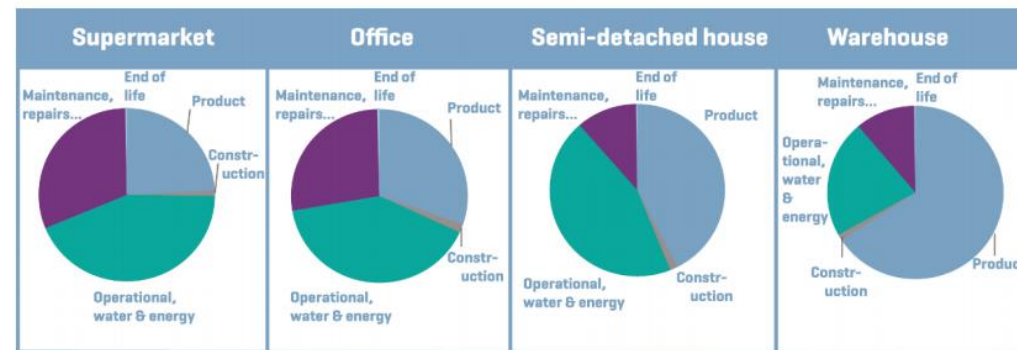


Figure 2: Impact of the consequent life cycle stages on the overall carbon footprint for different types of buildings, calculated over 30 years (RICS Professional Guidance, [Methodology to calculate the embodied carbon of materials](#), 1st Edition) or similar from [Embodied Carbon: Embodied Carbon -Relevance, Guidance and Methodology](#), Sean Lockie, Faithful +Gould

Depending on building type, by the time a building is occupied somewhere between 30% and 70% of its lifetime carbon may already have been accounted for (the higher end of this range is most likely in buildings such as warehouses and distribution centres or those built to Passivhaus standards, which have low operational carbon requirements).

Recognising this opportunity for carbon savings that is being missed, progressive clients, developers and contractors are increasingly measuring, managing and reducing the embodied carbon in building projects.

THE BUSINESS CASE

Cost reduction

One of the main sources of embodied carbon reductions in a building design is from the identification of efficiency gains, and thereby cost savings, through:

- the identification of designs that optimise building use
- the more efficient use of resources and materials
- the use of more resilient materials or ones that are more appropriate for the expected lifetime of the building/element
- and more efficient transportation and construction processes can all produce reductions in not only embodied carbon but also in cost

In this way embodied carbon management may be seen as a proxy for cost management, providing an additional means of value engineering at early design stages.

Capital investment can be reduced as can maintenance, repair and replacement costs.