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Strides forth in pursuit of ambitious climate action goals

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THE CITY OF LONDON CORPORATION STRIDES FORTH IN PURSUIT OF AMBITIOUS CLIMATE ACTION GOALS

As cities worldwide grapple with the urgent need for climate action, the City of London Corporation emerges as a beacon of innovation and determination, successfully pursuing its comprehensive Climate Action Strategy and showcasing collaborative efforts towards a sustainable future.

The City of London Corporation has been pursuing its bold Climate Action Strategy for almost four years. This comprehensive plan outlines the organisation's commitment to achieving net zero emissions, bolstering climate resilience, and fostering sustainable growth, both domestically and internationally, over the next two decades.

Key aspects of the Strategy include attaining net-zero carbon emissions from internal operations by 2027, extending this goal to encompass investments and the supply chain by 2040, and supporting the transition of the Square Mile, one of the world's foremost financial and professional services districts, to net-zero emissions by the same deadline.

Additionally, the organisation has pledged £68 million to advance these objectives, with a particular focus on allocating £15 million to enhance the Square Mile's preparedness for extreme weather events. This strategic endeavour is the result of a comprehensive evaluation of the organisation's activities and assets, culminating in a detailed plan to address emissions from financial and property investments, as well as the entirety of the supply chain.

The City Corporation has established a fully funded action plan for the period of 2020-2027, with annual targets specified within. The primary objective is to prioritise areas with the most significant impact for immediate attention. Progress data is disseminated through the Climate Action Dashboard, an interactive and transparent platform designed to visualise current data and advancements in alignment with The City Corporation's net zero and climate resilience objectives. After each year, a comprehensive report detailing progress against set targets is published.

Most recently, the organisation's 2023 progress report shows significant strides forward in reducing its carbon net emissions, achieving a remarkable 66% reduction from financial years 2018/2019 to 2022/2023. This progress puts it on track to attain net zero by 2027 in the City Corporation's operations.

Meanwhile, through various projects and programmes - - including mapping heat stress and flood risk scenarios for its properties in the Square Mile - it is addressing climate risks designed to safeguard its infrastructure, streets, and open spaces. It has also intensified its engagement efforts with stakeholders across the Square Mile, aiming to accelerate emissions reductions and achieve net zero by 2040.

The City Corporation's progress is meticulously monitored through key performance indicators, covering its operations, value chain, and the Square Mile. This is complemented by a thorough carbon footprint assessment of all emissions (Scopes 1, 2, and 3), verified by independent sustainability specialist Achilles against ISO 14064-1:2018 standards. This ensures robust progress reporting and makes the organisation one of the first local authorities to achieve assurance over its full value chain emissions, including financial investments.

Alderman Alison Gowman, the Climate Action Policy Lead for the City Corporation, says the progress that has already been made is a reflection of the diligent preparation, wide-reaching scope, and innovative thinking behind the development of its roadmap to net zero.

"We did a lot of good groundwork, working with partners to gain insight and knowledge, recognising best practice elsewhere, and assessing how we could apply strategies to our estate that would enable us to meet our targets. The overarching plan for the next three years is to be net zero in terms of our direct emissions. I'm confident that we will reach that target.

"That not only comes from the fact we have a very good team of people and partners collaborating on it to make that happen but because, through the data that we're gathering, which is publicly accessible and updated quarterly via our Climate Action Dashboard, we can see we're on target.

"We're also flexible. We're able to closely monitor our progress. If we discover that a strategy is not working as we want it to, or that we need to tackle a challenge differently, we have the capability within our teams and partners to make relevant changes rapidly."

Working in collaboration

Several partners are working with the City Corporation to ensure its ambitious Climate Action Strategy can be implemented and its objectives achieved. One of these is Arup which spearheaded a collaboration with the Carbon Trust to facilitate the development of the Strategy, conducting comprehensive greenhouse gas (GHG) emissions assessments. This included evaluating emissions beyond its direct control, aiding in the identification of actions crucial for fostering a low carbon future within the Square Mile.

Following the Strategy's launch in 2020, Arup was entrusted with supporting the implementation of the Climate Action Strategy, translating recommendations into a robust project programme. A novel approach was adopted for setting climate targets, recognising the Square Mile's significant role in translating commitments into tangible actions. Collaborating with the Carbon Trust, Arup devised an appropriate assessment and reporting methodology tailored to both the City Corporation and the Square Mile. This encompasses Scope 1, 2, and 3 emissions for the first time.

Arup facilitated the development, testing, and agreement on clear decarbonisation pathways by projecting baseline footprints over time, considering external factors like the decarbonisation of UK grid emissions. Various scenarios were modelled to pinpoint areas with the greatest potential for emissions reduction, each outlining specific actions. These actions included enhancing energy efficiency in operational buildings, maximising renewable energy usage, and aligning financial investments with the Paris Agreement goals.

An area of concern is how to achieve the sustainability standards the City Corporation aspires for without the need to carry out significant building works in future. To ensure this, it has established the Net Zero and Resilient Buildings Centre of Excellence to drive leadership, best practice, research, support, and training to all areas of building decarbonisation and resilience work.

It has worked closely with Arcadis to develop the criteria and standards which will govern the City Corporation's construction activities, including all refurbishments and new builds, in future with consideration of whole-life costs and cost analysis. Arcadis has provided Resilience Specialist support, facilitating the development of a Climate Impact Model with a focus on heat stress and flood risk, and developing a comprehensive Resilience Action Plan.

It has brought sustainability specialists on board to assist with investment property endeavours, such as formulating operation plans based on the insights gained from 130 full net zero carbon audit reports, conducting CRREM pathway analysis, and developing sustainable investment metrics for new acquisitions.

Moreover, Arcadis has spearheaded efforts in designing standards by creating and refining net zero carbon design and technology guidance, ensuring that projects incorporate the best available technology alongside an advanced design approach to meet future needs effectively. Introducing circular economy principles into the day-to-day activities of the City Corporation will ease the use of secondary materials and improve resource efficiency throughout the building lifecycle.

Furthermore, Arcadis has provided crucial support in the area of heat network development within the Square Mile, focusing on enhancing efficiency and fostering opportunities for heat decarbonisation. This includes strategic guidance to facilitate the growth of heat networks while aligning with government plans for the introduction of heat zones in the UK.

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"With a total capacity of 49.9 megawatts, the solar plant is poised to energise the equivalent of 15,000 homes and will furnish over half of the City of London's electricity needs. Notable recipients of this renewable energy include the historic Guildhall headquarters, three wholesale markets, and the esteemed Barbican Arts Centre."

Alderman Alison Gowman, *the Climate Action Policy Lead for the City of London* Corporation

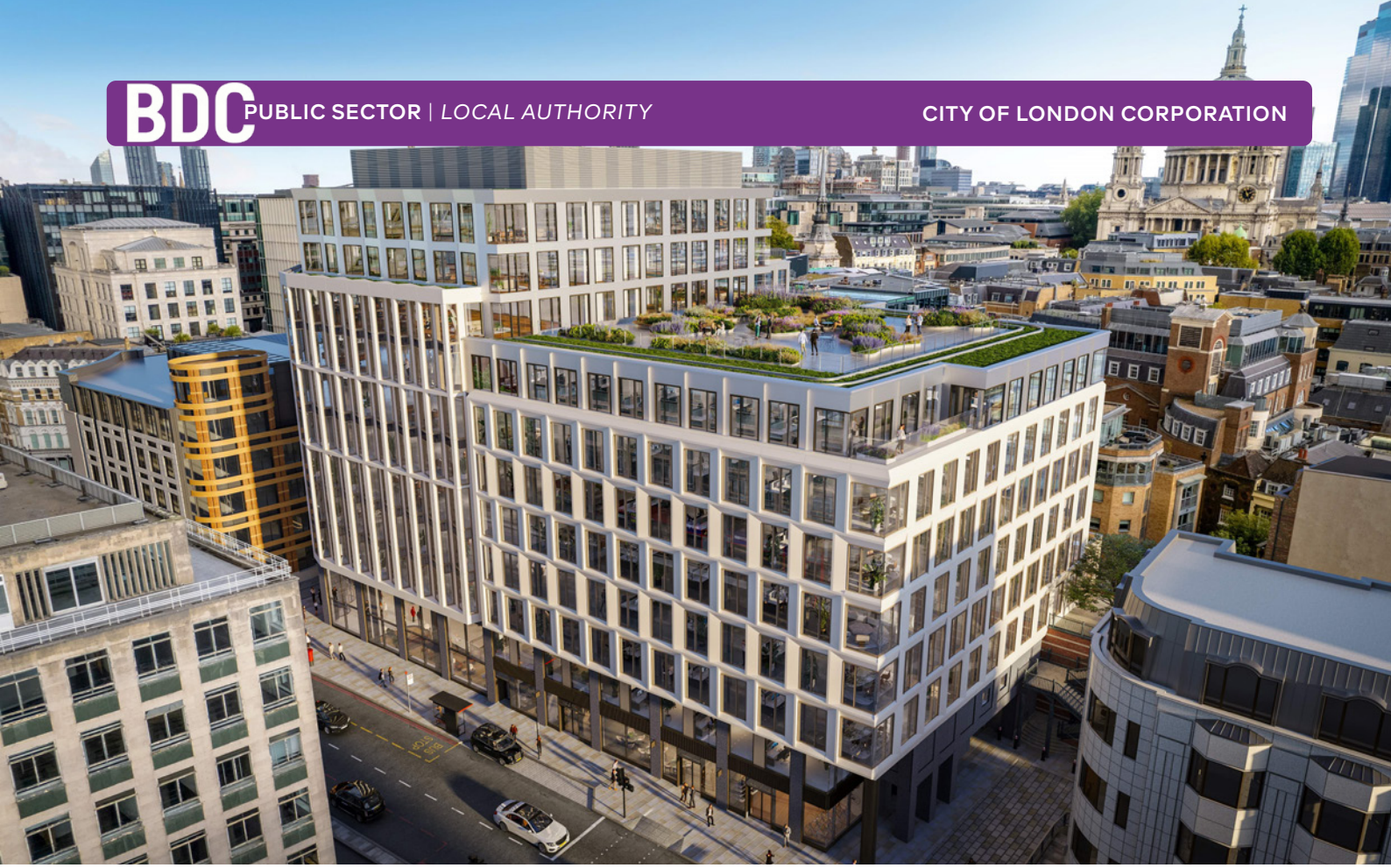
Embracing challenges

One of the challenges faced by the City Corporation is the decarbonisation of a host of heritage buildings, from churches to 19th-century townhouses and 20th-century estates like Barbican, each presenting their own unique quirks and requirements. A resource known as the Heritage Building Retrofit Toolkit has been launched in collaboration with Purcell to aid property owners in implementing necessary adjustments to lower carbon emissions and fortify against climate change.

It outlines a nine-step process to initiate responsible retrofitting, construct a viable business case, and execute adaptations in a manner that preserves these invaluable heritage and community assets. Although initially tailored for historic structures within the Square Mile, the toolkit's creators emphasise its applicability to municipalities both in the UK and internationally.

Structured around eight primary building archetypes prevalent in the Square Mile, such as places of worship and municipal edifices, the toolkit facilitates cross-comparisons and encourages a flexible and considerate approach to adaptation. With over 600 listed buildings, 28 conservation areas, 48 scheduled ancient monuments, and four historic parks and gardens, the City Corporation possesses a rich tapestry of heritage assets.

Alderman Gowman underscores the importance of ensuring these structures are future-proofed. "By maximising energy effi-



ciency, reducing carbon footprints, and adapting to climatic shifts, heritage buildings can be preserved for generations to come. The toolkit offers a systematic framework for pursuing these objectives, drawing upon the latest guidance and best practices," she says.

The Climate Action Strategy sees projects continually in motion but prominent initiatives currently include trialling new Building Management Systems across some of its social housing estate in Islington in consultation with residents. Elsewhere, The Guildhall is receiving a significant programme of works on its utilities with upgrades to, for example, its air-conditioning infrastructure, Heating Pump improvements and the introduction of LEDs. New, energy-efficient boilers have also been introduced at The Old Bailey as part of a wider programme of works on the building and its fabric. Furthermore, there are plans to introduce more solar PV at Hampstead Heath Lido and the London Metropolitan Archives, subject to planning approval.

Leveraging the benefits of green energy Power Purchase Agreements

The City Corporation is reaching out to SMEs to consider entering into collaborative green energy Power Purchase Agreements. The organisation hopes to leverage the knowledge it has gained from its own PPA, which came on stream in 2022. The pioneering £40 million green energy agreement with Voltalia stands as a potential model for local authorities aiming to both diminish carbon footprints and reduce expenses. The PPA secures the purchase of all electricity generated by a new solar farm comprising 95,000 panels in Dorset for 15 years.

This groundbreaking deal, the first of its kind in the UK directly between a renewable energy producer and a governing authority, allowed Voltalia to access capital for constructing the facility while offering the City Corporation an estimated £3 million in energy cost savings.

"Notably, this arrangement ensures cost predictability and mitigates the risks associated with municipally-owned energy enterprises," notes Alderman Gowman. "With a total capacity of 49.9 megawatts, the solar plant is poised to energise the equivalent of 15,000 homes and will furnish over half of the City Corporation's electricity needs. Notable recipients of this renewable energy include the historic Guildhall headquarters, three wholesale markets, and the esteemed Barbican Arts Centre."

A beacon of leadership and innovation

The City Corporation's steadfast commitment to ambitious climate action goals stands as a beacon of leadership and innovation in the pursuit of sustainability. Over the past four years, the organisation has demonstrated unwavering dedication to reducing carbon emissions, enhancing climate resilience, and fostering sustainable growth within the Square Mile and beyond.

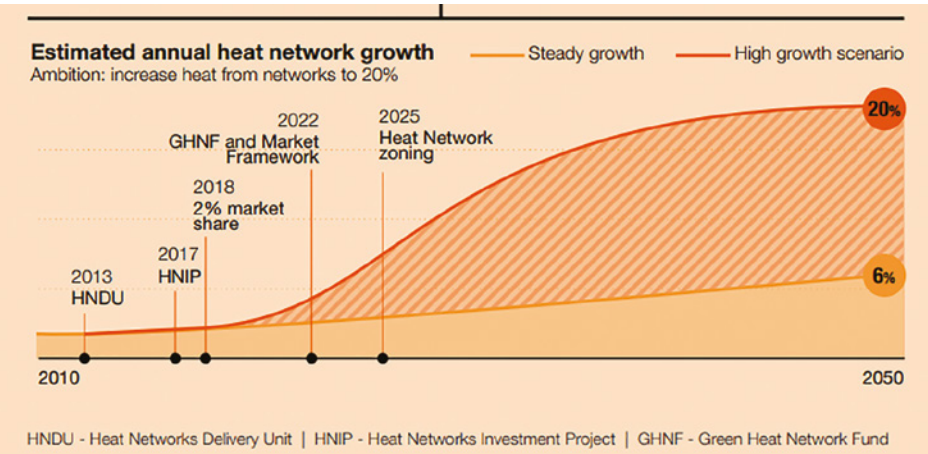
Through its comprehensive Climate Action Strategy, it has set clear targets and mobilised resources to achieve net zero carbon emissions in its operations by 2027, extending this commitment to investments and the supply chain by 2040. As Alderman Gowman aptly states, the City Corporation's progress to date is a testament to the diligence, adaptability, and collective effort of its teams and partners. With a clear roadmap in place and a culture of innovation driving its actions, the organisation is well-positioned to continue leading the charge towards a greener, more resilient future.

Cleaner air, secure energy, jobs and skills: Heat networks in the future City of London

The Government has prioritised the development of heat networks to provide more reliable and sustainable heating, improve air quality in cities by reducing the emissions associated with heating and, at the same time, support green jobs and skills . It is investing more than half a billion pounds to develop new heat networks and improve existing ones around the country.

Heat networks currently provide 3% of the total heat demand in the UK, with that number potentially growing to 20% nationwide by 2050 in order to deliver net zero. In London, the proportion of heat demand supplied by district heating could be as high as 40%. Delivering that 20% national potential is expected to need up to £80 billion of investment - mostly from private sector investment - and create about 30,000 jobs across the UK. This significant investment and job creation opportunity is the largest heat network investment potential in Europe.

The graphic below, produced by the Department for Energy Security and Net Zero estimates annual heat network growth to 2050.



E.ON already operates more than 60 heat networks around the UK - including the Citigen energy centre in Farringdon which has generated heat, cooling and electricity for an 11km underground network since the 1990s. With the introduction of Heat Network Zoning these systems, in conjunction with other new systems, have the potential to expand to provide district heating connections to all buildings within the City. This is the case in Copenhagen where 99% of dwellings are connected to the city-wide district heating network. Providing district heating to all buildings will have the significant benefit of reducing the use of fossil fuels in heating, both lowering carbon emissions and improving air quality.

One of the major challenges to the expansion of a district heating network will be the sources of low carbon heat needed to feed it. The dense, built-up nature of the City makes it very difficult to locate the large scale heat pumps which are required. These large heat pumps need a secure source of low-grade waste

heat or access to very large roof area for their evaporators. Both of these are in short supply in the City.

One possible solution lies in the very buildings which make up the majority of the built space in the City.

The City has recently confirmed in its City Plan 2040 a desire to build another 1.2 million square m2 of office space by 2040. These new office buildings come with an increasing demand for the energy needed to cool them, both to deal with their higher IT loads and the impact of global warming which is making cities warmer and warmer. For example, a 35-storey office development under construction near Liverpool Street has a cooling load of over 6 MW.

Usually, cooling to these office building is provided by air cooled chillers located at roof level. These reject their waste heat from the cooling process to the surrounding atmosphere. In doing so they greatly increase the 'heat island' effect in the City. They also occupy a considerable amount of very valuable roof space which could otherwise provide high amenity accommodation.

What if this waste heat is captured and reused as opposed to being lost? It could potentially be used to feed the expansion of the district heating network. Even in summer there are many other buildings connected to direct heating networks which have a heat demand - if not for heating then for hot water. Georgian and Victorian buildings, which are often Grade I or II listed and cannot be easily energy efficiently refurbished, require heat for most of the year. This heat can be provided by a district heating connection in a much more efficient manner than the alternative of visually unappealing Air Source Heat Pumps.

Over the last year, E.ON and Ramboll have been exploring how future new build offices can be designed in a way that enables them to be connected to an expanded district heating network. In this way these office building can move from being a **consumer** of high carbon heat (they would have normally used gas boilers) to **prosumers** of low carbon heat for the surrounding community.

The main technical challenge to achieve this two-way connection is to redesign the way chilled water for cooling the office is produced. Instead of large roof mounted air-cooled chillers producing chilled water, E.ON and Ramboll have explored the use of reversible water sourced heat pumps. These water source heat pumps are connected to a roof mounted evaporator. They are also connected to the chilled water circuit in the office building and to the heating circuit in the office building. In this way the water source heat pump can be run in the summer to produce both chilled water for cooling the office and heating water which can then be supplied back to the district heating network. In times when there is no demand for heat from the network then the reversible heat pump in conjunction with the roof mounted evaporator can still produce chilled water for cooling the office. In the depths of the winter when there may be no demand for cooling in the office building then the connection to the district heating connection allows the building to be supplied with heat.

New office buildings, not currently connected to the heat network, could have their heating and cooling systems configured in this manner when under construction, effectively being 'future proofed' to enable them to connect into a district heating network when it expands to reach them.

This concept utilises well established technology in a more novel an innovated application. It enables future office buildings to be built in a configuration which will provide a real benefit to the local community through the provision of low carbon, clean heat via a district heating connection. It feeds into the development of a sustainable and low carbon City.

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The power of partnership

As a leading Facilities Management provider across both hard and soft services, CBRE Global Workplace Solutions (GWS) are able to manage all elements of City Of London's FM service requirements. CBRE GWS began their partnership with City Of London in 2023 and manage 365 buildings across the City of London portfolio. As well as FM, we support City Of London in implementing continuous innovations and social value initiatives to ensure our service is kept up to date and competitive.

The Old Basement Car Park Guildhall Clearance Project

The City of London Corporation's unused basement staff car park was being used as a storage facility. CBRE GWS worked with our diverse suppliers DSA Connect and Crown Workplace to clear the staff car park at Guildhall. This project consisted of extracting 3,000+ items which included office furniture and IT equipment. From the clearance, 2,032 items went through component recovery, resulting in 720 items that could be reused.

The project had the following aims:

To clear the basement and support as many of City Of London's Responsible Procurement commitments as possible, those being: positive climate action, embed supplier diversity, facilitate equity, diversity and inclusion, provide work related opportunities and deliver meaningful social value outcomes.

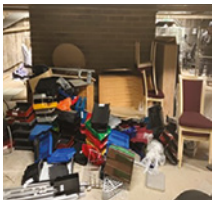
Demonstrate that the more sustainable option can be both the most efficient and effective operational and financial option.

Eliminate or limit the number of items going to landfill and help out the local community.

DSA Connect work in partnership with HMP Highpoint to provide old equipment from clearances to aid workshops for inmates to learn skills such as component recovery, repair, upgrading, and refurbishing IT equipment. Through Crown Workplace's donation programme *'Give Back'*, we were able to donate items to charities St Anne's Catholic High School and ICMG Bexley, both which aim to increase access to education.







720+ items were either reused, repaired or recycled

4,300KG CO_2 was saved

8 locations received items through collaboration with suppliers