THE DRAFT LONDON PLAN DECEMBER 2017

Consultation

CIBSE Response

Submitted 1ˢᵗ March 2018

Note – for clarity, the consultation questions are in non-italic black, and *CIBSE response in italic green*.

Introduction

*The respondent is **The Chartered Institution of Building Services Engineers (CIBSE).***

The Chartered Institution of Building Services Engineers is the professional body that exists to:

> *'support the Science, Art and Practice of building services engineering, by providing our members and the public with first class information'*

CIBSE members are the engineers who design, install, operate, maintain and refurbish the energy using systems installed in buildings, including homes, and are specifically trained in the assessment of heat loss from building fabric and the design of energy using systems for the provision of heating and hot water, lighting, ventilation and cooling and small power distribution in homes. Many CIBSE members work in the public sector in general and in higher education in particular.

CIBSE has over 20,000 members, of whom around 75% operate in the UK and many of the remainder in the Gulf, Hong Kong and Australasia. Many are actively involved in the energy management of commercial buildings for larger businesses, and so this consultation is highly relevant to us and to our members.

CIBSE is the sixth largest professional engineering Institution, and along with the Institution of Structural Engineers is the largest dedicated to engineering in the built environment. Our members design, install, manufacture, maintain, manage, operate and replace all the energy using systems in buildings as well as public health systems.

As an Institution CIBSE publishes Guidance and Codes which provide best practice advice and are internationally recognised as authoritative. The CIBSE Knowledge Portal, makes our Guidance available online to all CIBSE members and is the leading systematic engineering resource for the building services sector. Over the last twenty-one months it has been accessed over 200,000 times, and is used regularly by our members to access the latest guidance material for the profession. Currently we have users in over 170 countries, demonstrating the world leading position of UK engineering expertise in this field.

www.cibse.org

Consultation Questions

We welcome this consultation and strongly support the overall objectives of environmental improvements, carbon reduction, and a healthier city for all.

*There has been consistent feedback that the length and structure of the Plan make it difficult to **identify the key priorities** (e.g. air quality, carbon reduction) and, importantly, **how they link together**; we have made references to linkages in our response where relevant. A suggestion has also been made that it would be useful to identify, alongside these priorities, the **"big ticket" measures** that would help deliver a number of policies – for example, transport measures that would reduce carbon emissions, reduce air pollution, reduce noise (with*

associated benefits in reducing overheating risk), help deliver health improvements through active travel, offer opportunities for better quality open space etc. We think the draft Environment Strategy went some way towards this in its wording and visual diagrams on the main priorities and key measures, and we think a similar approach would be useful in the Plan itself.

Due to the extensive nature of the plan there are some aspects that could reasonably occur at several points, such as provision of green infrastructure and spaces. In such a large document it is better that things are included wherever relevant, ideally with cross references.

We think there is an opportunity to better utilise the digital version of the Plan in a fully searchable format that would also enable easy cross-referencing between issues, helping to reduce the tendency for users to focus on the area(s) that address their particular specialism. With the growing use of Building Information Modelling and other digital applications, it would be good for the Plan to be part of the digital infrastructure available to those who will use and deliver the Plan in daily working practice.

*On a number of policies we have noted the **opportunity to create clear, specific and measurable objectives** – we have highlighted these throughout our response where relevant. This applies in particular to **air quality and green infrastructure.** We have also noted a number of recommended enhancements to the proposed approach to **carbon reductions, both for new and existing buildings**.*

*The Mayor's intentions are ambitious and their delivery will require robust **implementation and monitoring** mechanisms; we would encourage support to local authorities to ensure suitable and consistent implementation at the local level, from the early planning stages through to post-construction conditions.*

*As stated above, we fully support the ambitions of the Plan. We believe meeting these ambitions can deliver benefits and value in the long-term by helping to preserve and enhance natural capital, protecting the health, wellbeing, and productivity of Londoners, and retained the city's status as attractive to live, work and visit. However, there needs to be a balance between **ambition and affordability**. This is not a core area of expertise from CIBSE therefore we have not commented in detail on this, however we have made some comments and suggestions where relevant in Chapter 11.*

The Mayor has noted a number of areas where further guidance will be produced; this would be welcome, particularly best practice examples of how the various objectives can be achieved holistically (e.g. combining objectives for low-carbon and low air pollution emissions; combining the objectives of housing density, urban greening and open space).

As one of the leading professional bodies in the built environment CIBSE is available to contribute its expertise to the development of the additional guidance. In particular we have a number of examples of good practice from the buildings that have won or been entered into the CIBSE Building Performance Awards, which have been running for over a decade and showcase buildings that do not just promise to perform, but deliver high standards of building performance.

Chapter 1 - Planning London's Future (Good Growth Policies)

1.   GG1 Building strong and inclusive communities

To build on the city's tradition of openness, diversity and equality, and help deliver strong and inclusive communities, those involved in planning and development must:
A - Seek to ensure that London continues to generate a wide range of economic and other opportunities, and that everyone is able to benefit from these to ensure that London is a fairer and more equal city.
B - Provide access to good quality services and amenities that accommodate, encourage and strengthen communities, increasing active participation and social integration, and addressing social isolation.
C - Ensure that streets and public spaces are planned for people to move around and spend time in comfort and safety, creating places where everyone is welcome, which foster a sense of belonging and community ownership, and where communities can develop and flourish.

D - Promote the crucial role town centres have in the social, civic, cultural and economic lives of Londoners, and plan for places that provide important opportunities for face-to-face contact and social interaction during the daytime, evening and night time.

E - Ensure that new buildings and the spaces they create are designed to reinforce or enhance the legibility, permeability, and inclusivity of neighbourhoods, and are resilient and adaptable to changing community requirements.

F - Support the creation of a London where all Londoners, including older people, disabled people and people with young children can move around with ease and enjoy the opportunities the city provides, creating a welcoming environment that everyone can use confidently, independently, and with choice and dignity, avoiding separation or segregation.

CIBSE response

We would stress the role that trees and accessible green space can play towards these broad objectives[1]; they are currently absent from the policy wording and we would recommend their mention, for example as part of objective GG1-C, to ensure they are part of planning decisions and local planning policy, and fully integrated into design proposals and budgets.

This is an example of an objective that we think needs to be reinforced in several places to ensure that it is given the priority that is intended, and we have made comments to this effect in several places in our response.

2. GG2 Making the best use of land

To create high-density, mixed-use places that make the best use of land, those involved in planning and development must:

A - Prioritise the development of Opportunity Areas, brownfield land, surplus public sector land, sites which are well-connected by existing or planned Tube and rail stations, sites within and on the edge of town centres, and small sites.

B - Proactively explore the potential to intensify the use of land, including public land, to support additional homes and workspaces, promoting higher density development, particularly on sites that are well-connected by public transport, walking and cycling, applying a design–led approach.

C - Understand what is valued about existing places and use this as a catalyst for growth and place-making, strengthening London's distinct and varied character.

D - Protect London's open spaces, including the Green Belt, Metropolitan Open Land, designated nature conservation sites and local spaces, and promote the creation of new green infrastructure and urban greening.

E - Plan for good local walking, cycling and public transport connections to support a strategic target of 80 per cent of all journeys using sustainable travel, enabling car-free lifestyles that allow an efficient use of land, as well as using new and enhanced public transport links to unlock growth.

F - Maximise opportunities to use infrastructure assets for more than one purpose, to make the best use of land and support efficient maintenance.

CIBSE response

We welcome the broad objectives and would stress the importance of mixed-use developments, including their contribution to other objectives of this Plan such as facilitating transport by walking and cycling, with associated benefits in terms of health, wellbeing, carbon emissions, and air quality.

3. GG3 Creating a healthy city

To improve Londoners' health and reduce health inequalities, those involved in planning and development must:

A - Ensure that the wider determinants of health are addressed in an integrated and co-ordinated way, taking a systematic approach to improving the mental and physical health of all Londoners and reducing health inequalities.

B - Promote more active and healthy lifestyles for all Londoners and enable them to make healthy choices.

C - Use the Healthy Streets Approach to prioritise health in all planning decisions.

D - Assess the potential impacts of development proposals on the health and wellbeing of communities, in order to mitigate any potential negative impacts and help reduce health inequalities, for example through the use of Health Impact Assessments.

E - Plan for improved access to green spaces and the provision of new green infrastructure.

F - Ensure that new buildings are well-insulated and sufficiently ventilated to avoid the health problems associated with damp, heat and cold.

G - Seek to create a healthy food environment, increasing the availability of healthy food and restricting unhealthy options.

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[1] WHO, *Urban Green Spaces and Health – A Review of Evidence*, 2016

We support these general objectives and welcome the recognition of the potential for the built environment to contribute to public health strategies and help address health inequalities.

We welcome the intent to take account of the long-term impact of built environment decisions on communities. We agree that Heath Impact Assessments may be one option which could help better reward and incentivise the decisions which support better outcomes (for example through the use of S106 contributions).

HIAs are however still a relatively new area, with knowledge and supporting evidence still being built upon. We understand that their adoption has so far been limited, and that Local Authorities would greatly benefit from additional resources (e.g. staff, training, guidance) on the application of HIAs. We would be happy to cooperate with the Mayor on this issue.

*We would stress that **air quality** is an essential and inescapable part of achieving the broad objectives of this policy, and would therefore strongly encourage a strengthening of policy SI1, as noted in our comments on that policy.*

4. GG4 Delivering the homes Londoners need

To create a housing market that works better for all Londoners, those involved in planning and development must:
A - Ensure that more homes are delivered.
B - Support the delivery of the strategic target of 50 per cent of all new   homes being genuinely affordable.
C - Create mixed and inclusive communities, with good quality homes that meet high standards of design and provide for identified needs, including for specialist housing.
D - Identify and allocate a range of sites, including small sites, to deliver housing locally, supporting skilled precision-manufacturing that can increase the rate of building, and planning for all necessary supporting infrastructure from the outset.
E - Establish ambitious and achievable build-out rates at the planning stage, incentivising build-out milestones to help ensure that homes are built quickly and to reduce the likelihood of permissions being sought to sell land on at a higher value.

CIBSE response

Quality should be given as much importance as quantity:

- *Post-occupancy evaluation should be encouraged to assess resident satisfaction and identify whether needs are met; on major developments it could be mandated for at least a proportion of the dwellings, and wherever possible should be a condition of permissions for affordable developments.*
- *Energy monitoring <u>should</u> also be carried out, to identify issues of under-performance and high running costs (with possible fuel poverty implications) – see more details in our response to policy SI2. This should be established in such a way that the monitoring is undertaken <u>and data reported</u> within the constraints of legitimate confidentiality and data protection provisions, as this will help to deliver the data needed to improve energy management and to inform policy makers on current typical levels of operational energy use.*

5. GG5 Growing a good economy
6. GG6 Increasing efficiency and resilience

To help London become a more efficient and resilient city, those involved in planning and development must:
A - Seek to improve energy efficiency and support the move towards a low carbon circular economy, contributing towards London becoming a zero carbon city by 2050.
B - Ensure buildings and infrastructure are designed to adapt to a changing climate, making efficient use of water, reducing impacts from natural hazards like flooding and heatwaves, and avoiding contributing to the urban heat island effect.
C - Create a safe and secure environment which is resilient against the impact of emergencies including fire and terrorism.
D - Take an integrated approach to the delivery of strategic and local infrastructure by ensuring that public, private, community and voluntary sectors plan and work together.

CIBSE response

We fully support these intents. Achieving them will rely on robust policies, implementation and monitoring.

We have highlighted throughout this Plan recommendations for where the current policies could be strengthened, including SI2 and SI3 – Policies towards a zero-carbon city, SI7 – Circular Economy, Chapter 8 – Green Infrastructure, and Chapter 12 - Monitoring.

__GG6-A:__ We very much welcome the prominent role given to energy efficiency as part of the ambition to become a zero carbon city by 2050.

We would stress that energy efficiency objectives should apply to __existing buildings__ as well as new buildings – while in theory covered by the same policy, these are often not required to demonstrate significant improvements in practice. In our response to policy SI2 we have highlighted recommendations for carbon saving opportunities on __major refurbishments__ that are subject to planning applications, as well as energy retrofit opportunities through the use of __carbon offset funds__.

__GG6-B:__ We support the need to consider the impact of climate change and develop adaptation strategies. We would stress the potential of __green infrastructure__ to contribute to these; in particular, green infrastructure can provide a local cooling effect and improve rainwater run-off management, i.e. help with the two likely most tangible effects of climate change in London, as well as enhancing air quality. This key role of green infrastructure for climate change adaptation and resilience is one of the reasons why we are advocating for a strengthening of these policies (among other benefits such as carbon emissions and air quality) – see our response to Chapter 8.

We would encourage adaptation strategy programmes which are informed by central government efforts, including the upcoming National Adaptation Plan[2], based on the 2017 UK Climate Change Risk Assessment[3]; we note however that policies by the Mayor of London are likely to go further than national efforts, as acknowledged recently by the Environment Agency[4]. This is an opportunity for the Mayor of London to demonstrate leadership.

As noted above in relation to Health Impact Assessments, we suggest that Local Authorities would greatly benefit from additional resources (e.g. staff, training, guidance) on this policy, and as with HIAs we would be willing to assist the Mayor in the development of guidance and identification of existing material to support local authorities and the development community.

Chapter 2 - Spatial Development Patterns

7. SD1 Opportunity Areas
8. SD2 Collaboration in the Wider South East
9. SD3 Growth locations in the Wider South East and beyond
10. SD4 The Central Activities Zone (CAZ)
11. SD5 Offices, other strategic functions and residential development in the CAZ
12. SD6 Town centres
13. SD7 Town centre network
14. SD8 Town centres: development principles and Development Plan Documents
15. SD9 Town centres: Local partnerships and implementation
16. SD10 Strategic and local regeneration

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[2] APPG briefing, *Preparing for Climate Change: A New National Adaptation Programme*, February 2018 – Event Summary
http://www.policyconnect.org.uk/appccg/sites/site_appccg/files/report/568/fieldreportdownload/appccgeventsummary-preparingforclimatechange-anewnationaladaptationprogramme-february2018.pdf
[3] https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2017
[4] APPG briefing, *Preparing for Climate Change: A New National Adaptation Programme*, February 2018 – Presentation Slides
http://www.policyconnect.org.uk/appccg/sites/site_appccg/files/report/567/fieldreportdownload/apppccgeventslides-nap_0.pdf

Chapter 3 – Design

17. D1 London's form and characteristics

Development Plans, area-based strategies and development proposals should address the following:

A - The form and layout of a place should:
1) use land efficiently by optimising density, connectivity and land use patterns
2) facilitate an inclusive environment
3) be street-based with clearly defined public and private environments
4) deliver appropriate outlook, privacy and amenity
5) achieve safe and secure environments
6) provide active frontages and positive reciprocal relationships between what happens inside the buildings and outside in the public realm to generate liveliness and interest
7) provide conveniently located green and open spaces for social interaction, play, relaxation and physical activity
8) encourage and facilitate active travel with convenient and inclusive pedestrian and cycling routes, crossing points, cycle parking, and legible entrances to buildings, that are aligned with peoples' movement patterns and desire lines in the area
9) help prevent or mitigate the impacts of noise and poor air quality
10) facilitate efficient servicing and maintenance of buildings and the public realm, as well as deliveries, that minimise negative impacts on the environment, public realm and vulnerable road users.

B - Development design should:
1) respond to local context by delivering buildings and spaces that are positioned and of a scale, appearance and shape that responds successfully to the identity and character of the locality, including to existing and emerging street hierarchy, building types, forms and proportions
2) be of high quality, with architecture that pays attention to detail, and gives thorough consideration to the practicality of use, flexibility, safety and building lifespan, through appropriate construction methods and the use of attractive, robust materials which weather and mature well
3) aim for high sustainability standards
4) respect, enhance and utilise the heritage assets and architectural features that make up the local character
5) provide spaces and buildings that maximise opportunities for urban greening to create attractive resilient places that can also help the management of surface water
6) achieve comfortable and inviting environments both inside and outside buildings.

CIBSE response

We broadly support the objectives, including preventing and mitigating the impacts of noise and poor air quality, aiming for high sustainability standards, creating comfortable environments and maximizing opportunities for urban greening for resilience and surface water management.

We notice that the Policy does not directly refer to energy efficiency or to the indoor environment. However the form and characteristics of London's buildings has a fundamental impact on the ability to provide low carbon, healthy, comfortable adaptable and resilient homes, workplaces and public buildings.

Successfully delivering Policy G6 is inextricably linked with Policy D1.

*Where possible these intents need to be linked to **clear measurable objectives**, with **reporting and monitoring**. We have commented in more detail on individual policies throughout our response.*

We would also encourage green areas to be accessible and visible where possible, in order to maximise their benefits for urban dwellers.

See also response to Chapter 8 Green Infrastructure and Natural Environment.

18. D2 Delivering good design

Initial evaluation

A - To identify an area's capacity for growth and understand how to deliver it in a way which strengthens what is valued in a place, boroughs should undertake an evaluation, in preparing Development Plans and area- based strategies, which covers the following elements:

   1) socio-economic data (such as Indices of Multiple Deprivation, health and wellbeing indicators, population density, employment data, educational qualifications, crime statistics)

   2) housing type and tenure

   3) urban form and structure (for example townscape, block pattern, urban grain, extent of frontages, building heights and density)

   4) transport networks (particularly walking and cycling networks), and public transport connectivity (existing and planned)

   5) air quality and noise levels

   6) open space networks, green infrastructure, and water bodies

   7) historical evolution and heritage assets (including an assessment of their significance and contribution to local character)

   8) topography and hydrology

   9) land availability

   10) existing and emerging development plan designations

   11) existing and future uses and demand for new development, including housing requirements and social infrastructure.

Determining capacity for growth

B - The findings of the above evaluation (part A), taken together with the other policies in this Plan should inform sustainable options for growth and be used to establish the most appropriate form of development for an area in terms of scale, height, density, layout and land uses. The outcome of this process must ensure the most efficient use of land is made so that development on all sites is optimised.

Design analysis and visualisation

C - Where appropriate, visual, environmental and movement modelling/ assessments should be undertaken to analyse potential design options for an area, site or development proposal. These models, particularly 3D virtual reality and other interactive digital models, should, where possible, be used to inform and engage Londoners in the planning process.

Design quality and development certainty

D - Masterplans and design codes should be used to help bring forward development and ensure it delivers high quality design and place- making based on the characteristic set out in Policy D1 London's form and characteristics.

Design scrutiny

E - Design and access statements submitted with development proposals should provide relevant information to demonstrate the proposal meets the design requirements of the London Plan.

F - Boroughs and applicants should use design review to assess and inform design options early in the planning process. Design review should be in addition to the borough's planning and urban design officers' assessment and pre-application advice. Development proposals referable to the Mayor must have undergone at least one design review early on in their preparation, before a planning application is made, if they:

   1) are above the applicable density indicated in Part C of Policy D6 Optimising housing density; or

   2) propose a building defined as a tall building by the borough (see Policy D8 Tall buildings), or that is more than 30m in height where there is no local tall building definition.

G - The format of design reviews for any development should be agreed with the borough and comply with the Mayor's guidance on review principles, process and management *(details omitted here)*

Maintaining design quality

H The design quality of development should be retained through to completion by:

   1) having a sufficient level of design information, including key construction details provided as part of the application to ensure the quality of design can be maintained if the permitted scheme is subject to subsequent minor amendments

   2) ensuring the wording of the planning permission, and associated conditions and legal agreement, provide clarity regarding the quality of design

   3) avoiding deferring the assessment of the design quality of large elements of a development to the consideration of a planning condition or referred matter

   4) local planning authorities using architect retention clauses in legal agreements where appropriate.

CIBSE response

We support the importance given to design and are broadly supportive of the proposed approach, starting with early site analysis including environmental factors.

We agree it is essential to maintain attention on quality throughout the design development and construction. This is often not the case, particularly as implementation and monitoring or planning conditions is left to local

19. D3 Inclusive design

A - To deliver an inclusive environment and meet the needs of all Londoners, development proposals are required to achieve the highest standards of accessible and inclusive design, ensuring they:
    1) can be entered and used safely, easily and with dignity by all
    2) are convenient and welcoming with no disabling barriers, providing independent access without additional undue effort, separation or special treatment
    3) are designed to incorporate safe and dignified emergency evacuation for all building users. In developments where lifts are installed, as a minimum at least one lift per core (or more subject to capacity assessments) should be a fire evacuation lift suitable to be used to evacuate people who require level access from the building.
B - The Design and Access Statement, submitted as part of planning applications, should include an inclusive design statement.

CIBSE response

We support the intent to design inclusive environments, but cannot comment in detail as it is not our core area of expertise. However, the ability of those who depend on lifts or other assistance to move within buildings to fully enjoy equal access is dependent not just on provision of assistance, but on it working and being maintained so that it works when they need it. Too often design for access is driven by the minimum to meet standards or guidance relating to construction, without adequate consideration of maintenance and operational performance and delivering a genuinely inclusive user experience. Too much emphasis on controlling build costs at the expense of the whole life performance may mean that lifts, for example, are frequently unavailable. We would encourage the Mayor to consider more explicit focus on maintenance and effective availability of access systems.

On fire safety, see responses to policy D11.

20. D4 Housing quality and standards

A - To optimise the development of housing on sites across London a range of housing typologies will need to be built. To bring forward development on constrained sites, innovative housing designs that meet the requirements of this policy, including minimum space standards, are supported. In ensuring high quality design, housing developments should consider the elements that enable the home to become a comfortable place of retreat and should not differentiate between housing tenures.
B - New homes should have adequately-sized rooms and convenient and efficient room layouts which are functional, fit for purpose and meet the changing needs of Londoners over their lifetimes. Particular account should be taken of the needs of children, disabled and older people.
C - Qualitative aspects of a development are key to ensuring successful sustainable housing and should be fully considered in the design of any housing developments.
D - Housing developments are required to meet the minimum standards below. These standards apply to all tenures and all residential accommodation that is self-contained.
      Private internal space *(details of the space standards omitted here)*
      Private outside space *(details of the space standards omitted here)*
E - Residential development should maximise the provision of dual aspect dwellings and normally avoid the provision of single aspect dwellings. A single aspect dwelling should only be provided where it is considered a more appropriate design

solution to meet the requirements of Policy D1 London's form and characteristics than a dual aspect dwelling and it can be demonstrated that it will have adequate passive ventilation, daylight and privacy, and avoid overheating.

F - The design of development should provide sufficient daylight and sunlight to new housing that is appropriate for its context, whilst avoiding overheating, minimising overshadowing and maximising the usability of outside amenity space.

G - Dwellings should be designed with adequate and easily accessible storage space that supports the separate collection of dry recyclables (for at least card, paper, mixed plastics, metals, glass) and food.

The Mayor will produce guidance on the implementation of this policy for all housing tenures.

CIBSE response

D4-A: *We strongly support the application of essential standards related to the environment, health, wellbeing, safety and security (e.g. daylight and sunlight, energy efficiency, thermal comfort, acoustics etc) which do* not *differentiate between housing tenures.*

We would like to highlight from industry feedback that an informal and unofficial rule in planning applications seems to apply, under which daylight provision is considered appropriate across a development if the recommended standards are met in at least 80% of the dwellings or rooms; while this may at first glance seem reasonable, in practice this typically results in the dwellings with poorer daylight and sunlight levels being those allocated to affordable or social rent housing (e.g. in shaded blocks, denser areas of the site, or at lower levels). This would not meet this proposed policy objective (D4-A) which calls for consistent standards being applied across tenures, which we fully support, nor does it help address health inequalities (Policy GG3). Guidance should be provided to Local Authorities so that, when such occurrences happen that daylight and sunlight levels are inconsistent across a development, the differences are not simply reflected in tenure types. Ideally the daylighting issues should be addressed by modifications to the plan.

D4-E: *We support the provision of* **dual-aspect dwellings***, which can offer many benefits in terms of access to direct sunlight, ventilation, acoustics (e.g. likelihood of openings on quieter facades), with subsequent potential advantages for overheating risk mitigation. Single-aspect dwellings should wherever possible be limited to studios and 1-bed apartments, as in the current London Plan.*

D4-F: *There is no definition in this policy of what constitutes* **"sufficient daylight and sunlight"** *– we would recommend reference to best practice guidance, including the BRE "Site Layout Planning for daylight and sunlight" for early design and site layout guidance, and BS 8206 2:2008 "Lighting for buildings - Code of practice for daylighting" and the SLL LG10:14 "Daylighting – A guide for designers" for internal daylight, sunlight, and views out. We are aware of concerns that the BRE guidance does not always lead to good daylight and sunlight levels being delivered in practice, while at the same time being seen as too restrictive on other occasions. Other alternative or complementary approaches have been proposed[5]. We do not consider there is yet consensus on this issue; we would at this stage recommend the application of minimum standards to guarantee consistency across housing tenures, and we would highlight that a more flexible approach without reference to minimum standards would be even more reliant on local authorities' skills, expertise, and resources.*

D4-G: *It is notable that whilst space for recyclables is covered, there is no mention of safe and secure cycle storage, though it is covered more explicitly in the Transport chapter. One way to further encourage cycling and reduce reliance on cars, supporting objectives set out in Chapter 1, is to provide adequate secure storage for bicycles wherever possible.*

Further guidance from the Mayor: *we think professionals are well-placed to explore and develop design solutions as along as the desired outcomes are clear. While design guidance may be provided to assist project teams if needed, it would be particularly useful to provide* **best practice examples***, already built and across housing types and tenures. CIBSE would be happy to collaborate with the Mayor's team on this to provide examples of high sustainability standards.*

21. **D5 Accessible housing**

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[5] for example: GIA & London First, *Unlocking Residential Density*, 2017

A To provide suitable housing and genuine choice for London's diverse population, including disabled people, older people and families with young children, residential development must ensure that:

1) at least 10 per cent of new build dwellings meet Building Regulation requirement M4(3) 'wheelchair user dwellings', i.e. designed to be wheelchair accessible, or easily adaptable for residents who are wheelchair users

2) all other new build dwellings meet Building Regulation requirement M4(2) 'accessible and adaptable dwellings'.

CIBSE response

We cannot comment on what constitute sufficient provision in number terms, nor the detailed measures, but we support the intent to provide accessible environment.

22. D6 Optimising housing density

A - Development proposals must make the most efficient use of land and be developed at the optimum density. The optimum density of a development should result from a design-led approach to determine the capacity of the site. Particular consideration should be given to:

1) the site context

2) its connectivity and accessibility by walking and cycling, and existing and planned public transport (including PTAL)

3) the capacity of surrounding infrastructure.

Proposed residential development that does not demonstrably optimise the housing density of the site in accordance with this policy should be refused.

B - The capacity of existing and planned physical, environmental and social infrastructure to support new development should be assessed and, where necessary, improvements to infrastructure capacity should be planned to support growth.

1) The density of development proposals should be based on, and linked to, the provision of future planned levels of infrastructure rather than existing levels.

2) The ability to support proposed densities through encouraging active travel should be taken into account.

3) Where there is currently insufficient capacity of existing infrastructure to support proposed densities (including the impact of cumulative development), boroughs should work with applicants and infrastructure providers to ensure that sufficient capacity will exist at the appropriate time. This may mean, in exceptional circumstances, that development is contingent on the provision of the necessary infrastructure and public transport services and that the development is phased accordingly.

C - The higher the density of a development, the greater the level of scrutiny that is required of its design, particularly the qualitative aspects of the development design described in Policy D4 Housing quality and standards, and the proposed ongoing management. Development proposals with a residential component that are referable to the Mayor must be subject to the particular design scrutiny requirements set out in part F of Policy D2 Delivering good design and submit a management plan if the proposed density is above:

1) 110 units per hectare in areas of PTAL 0 to 1; or

2) 240 units per hectare in areas of PTAL 2 to 3; or

3) 405 units per hectare in areas of PTAL 4 to 6.

D - The following measures of density should be provided for all planning applications that include new residential units:

1) number of units per hectare; 2) number of habitable rooms per hectare; 3) number or bedrooms per hectare; 4) number of bedspaces per hectare.

E - The following additional measures should be provided for all major planning applications:

1) the Floor Area Ratio (total Gross External Area of all floors / site area); 2) the Site Coverage Ratio (Gross External Area of ground floors /site area); 3) the maximum height in metres above ground level of each building and at Above Ordinance Datum (above sea level).

These built form and massing measures should be considered in relation to the surrounding context to help inform the optimum density of a development.

CIBSE response

We support the principle that development should take account of existing infrastructure, including transport accessibility but also other infrastructure needs, including accessible green space. Opportunities for improvements should also be taken into account.

The detailed implications of delivering high housing densities are not CIBSE's core expertise; in particular, we note concerns expressed by professionals about the notion of "optimising density" (what are the criteria to define the optimum, and how context-dependent is it?), but we do not feel in a position to comment in detail ourselves. However, density can have a strong impact on the achievement of other core objectives, including environmental, health and wellbeing objectives, and there are concerns about a potential conflict between the

*current density objects and others such as daylight / sunlight in housing (policy D4-F), outdoor amenity (policy D7), green infrastructure (policy G1) and urban greening (policy G5). We therefore agree with D6-D i.e. that **schemes of high densities should be subject to strong scrutiny**. We also think **the policies in potential conflict should be strengthened**, as detailed in our response to these policies.*

We note that a recent independent report[6] reviewed whether high-density housing schemes could be delivered that were manageable, financially viable AND met other essential objectives such as daylight / sunlight and access to amenities and green space. They concluded with a warning against densities above 350 dwellings per ha, with exceptions only if subject to rigorous impact testing. If the policy goal of 405 dwellings per ha is retained, we would strongly recommend that schemes are subject to a high level of evaluation coupled with access to advice and guidance at an early stage, and we would encourage the Mayor's team to provide examples of how such densities can be achieved while also meeting the Mayor's other essential objectives, including urban greening, access to open space, reducing overheating risks and delivering appropriate daylight/sunlight levels.

As noted in our response to policy D4, we are aware of alternative approaches being proposed for daylight/sunlight access at high densities[7]; we do not think there is currently enough consensus on this issue and are wary that this would place even more reliance on robust design reviews and local authorities resources. We do not therefore feel in a position at this stage to advocate these alternative approaches until it is clear whether they are appropriate technically and in the London development context.

23. D7 Public realm

Development Plans and development proposals should:

A - Ensure the public realm is safe, accessible, inclusive, attractive, well- connected, easy to understand and maintain, and that it relates to the local and historic context, and incorporates the highest quality design, landscaping, planting, street furniture and surfaces.

B - Maximise the contribution that the public realm makes to encourage active travel and ensure its design discourages travel by car and excessive on-street parking, which can obstruct people's safe enjoyment of the space. This includes design that reduces the impact of traffic noise and encourages appropriate vehicle speeds.

C - Be based on an understanding of how the public realm in an area functions and creates a sense of place, during different times of the day and night, days of the week and times of the year. In particular, they should demonstrate an understanding of the types, location and relationship between public spaces in an area, identifying where there are deficits for certain activities, or barriers to movement that create severance for pedestrians and cyclists.

D - Ensure both the movement function of the public realm and its function as a place are provided for and that the balance of space and time given to each reflects the individual characteristics of the area. The priority modes of travel for the area should be identified and catered for, as appropriate. Desire lines for people walking and cycling should be a particular focus, including the placement of street crossings.

E - Ensure there is a mutually supportive relationship between the space, surrounding buildings and their uses, so that the public realm enhances the amenity and function of buildings and the design of buildings contributes to a vibrant public realm.

F - Ensure buildings are of a design that activates and defines the public realm, and provides natural surveillance. Consideration should also be given to the local microclimate created by buildings, and the impact of service entrances and facades on the public realm.

G - Ensure appropriate management and maintenance arrangements are in place for the public realm, which maximise public access and minimise rules governing the space to those required for its safe management in accordance with the Public London Charter

H - Incorporate green infrastructure into the public realm to support rainwater management through sustainable drainage, reduce exposure to air pollution, manage heat and increase biodiversity.

I - Ensure that shade and shelter are provided with appropriate types and amounts of seating to encourage people to spend time in a place, where appropriate. This should be done in conjunction with the removal of any unnecessary or dysfunctional clutter or street furniture to ensure the function of the space and pedestrian amenity is improved. Applications which seek to introduce unnecessary street furniture should normally be refused.

J - Explore opportunities for innovative approaches to improving the public realm such as open street events.

K - Create an engaging public realm for people of all ages, with opportunities for formal and informal play and social activities during the daytime, evening and at night. This should include identifying opportunities for the meanwhile use of sites in early phases of development to create temporary public realm.

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[6] PTEa et al, *Superdensity: The Sequel*, 2015 http://www.pollardthomasedwards.co.uk/download/SUPERDENSITY_2015_download.pdf
[7] for example: GIA & London First, *Unlocking Residential Density*, 2017

L - Ensure that on-street parking is designed so that it is not dominant or continuous, and that there is space for green infrastructure as well as cycle parking in the carriageway. Pedestrian crossings should be regular, convenient and accessible.

M - Ensure the provision and future management of free drinking water at appropriate locations in new or redeveloped public realm.

CIBSE response

We broadly support the objectives and the recognition of the role that the public realm, active street frontages and the incorporation of green infrastructure can play in helping and encouraging healthy, active, sustainable lifestyles and modes of transport. Good quality outdoor spaces are fundamental to environmental and health and wellbeing objectives, and this becomes even more critical in dense urban areas.

*As noted in our response to policy D7, there is a potential conflict between this policy and the Plan's density objectives. We therefore think **this policy should be strengthened, with clear objectives and possibly an overall "amenity strategy"** for London, or for each Borough, or for both.*

__D7-F:__ We support giving consideration to microclimates and local conditions in the design of outdoor spaces, including daylight and sunlight access, especially for play areas to maximise their use and health & wellbeing benefits. For examples of such strategic considerations, we would refer to city planning by Hong-Kong[8] and Stuttgart[9] , which include local- to micro-climate considerations incorporating the impact of green infrastructure, land uses, massing etc. CIBSE would be happy to collaborate with the Mayor's team on this issue. We have a significant membership in Hong Kong who can contribute expertise. See also our response to policy D8 on the impact of tall buildings.

__D7-G:__ We strongly support the importance of maintenance and management arrangements to be in place, and think more guidance should be provided to the Boroughs on this – see our comments in Chapter 8 Green Infrastructure.

*__D7-H:__ In order for this objective on green infrastructure to be delivered, **it should be strengthened**, at the very minimum by a clear reference to policies G1 and G5 and a strengthening of these policies – see more details in our responses to these policies and to Chapter 12 on Monitoring.*

*__D7-L:__ We would welcome a review of the potential for the shared economy to **free space currently allocated to individual car-parking spaces**, with space becoming available in the future for other uses such as play areas, green space etc. This could include ensuring that new developments have a strategy in place for future reductions in individual car-parking spaces, and studies in existing areas e.g. housing estates, residential streets, retail parks. This also links to our comment on the reference to cycle storage under D4. CIBSE would be happy to collaborate with the Mayor's team on this.*

__D7-M:__ We support in principle the provision of free drinking water at key locations, as this can encourage active lifestyles and provide important health support during heatwaves; this should however not contribute to plastic waste (i.e. water should be provided by fountains, not plastic bottles), nor to water wastage (e.g. fountains could be activated by foot pedals, which are hygienic and limit water wastage).

24. D8 Tall buildings

Tall buildings have a role to play in helping London accommodate its expected growth as well as supporting legibility across the city to enable people to navigate to key destinations. To ensure tall buildings are sustainably developed in appropriate locations, and are of the required design quality, Development Plans and development proposals must undertake the following:

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[8] The Government of the Hong Kong Special Administrative Region, Planning Department, *Hong Kong Planning Standards and Guidelines - Chapter 11: Urban Design Guidelines*, 2005, last revision 2015
http://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/ch11/pdf/ch11.pdf
[9] City of Stuttgart, Directorate for Urban Development and Environmental Protection, Office for Environmental Protection, *Scripts by the Office for Environmental Protection - No. 1/2009, Environmental aspects in spatial planning in Stuttgart*, April 2009
http://www.stadtklima-stuttgart.de/stadtklima_filestorage/download/AfU-Script-01-2009_E.pdf

Definition

A - Based on local context, Development Plans should define what is considered a tall building, the height of which may vary in different parts of London.

Tall building locations

B - Tall buildings should be part of a plan-led approach to changing or developing an area. Boroughs should identify on maps in Development Plans the locations where tall buildings will be an appropriate form of development in principle, and should indicate the general building heights that would be appropriate, taking account of:

    1) the visual, functional, environmental and cumulative impacts of tall buildings (set out in part C below)

    2) their potential contribution to new homes, economic growth and regeneration

    3) the public transport connectivity of different locations.

Impacts

C - The impacts of a tall building can be visual, functional or environmental. All three elements should be considered within plan-making and in deciding development proposals:

    1) Visual impacts

        a) The views of buildings from different distances need to be considered, including long-range, mid-range and immediate views *(detailed omitted here)*

        b) Whether part of a group or stand-alone, tall buildings should reinforce the spatial hierarchy of the local and wider context and aid legibility and wayfinding

        c) Architectural quality and materials should be of an exemplary standard to ensure the appearance and architectural integrity of the building is maintained through its lifespan

        d) Proposals should take account of, and avoid harm to, the significance of London's heritage assets and their settings. Proposals resulting in harm will require clear and convincing justification, demonstrating that alternatives have been explored and there are clear public benefits that outweigh that harm. The buildings should positively contribute to the character of the area

        e) Buildings in the setting of a World Heritage Site must preserve the Outstanding Universal Value of the World Heritage Site, and the ability to appreciate it

        f) Buildings near the River Thames, particularly in the Thames Policy Area, should not contribute to a canyon effect along the river which encloses the open aspect of the river and the riverside public realm, or adversely affect strategic or local views along the river

        g) Buildings should not cause adverse reflected glare.

    2) Functional impact

        a) The internal and external design, including construction detailing, the building's materials and its emergency exit routes must ensure the safety of all occupants

        b) Buildings should be serviced, maintained and managed in a manner that will preserve their safety and quality, and not cause disturbance or inconvenience to surrounding public realm. Servicing, maintenance and building management arrangements should be considered at the start of the design process

        c) Entrances, access routes, and ground floor uses should be designed and placed to allow for peak time use and to ensure there is no unacceptable overcrowding or isolation in the surrounding areas

        d) It must be demonstrated that the capacity of the area and its transport network is capable of accommodating the quantum of development in terms of access to facilities, services, walking and cycling networks, and public transport for people living or working in the building

        e) Infrastructure improvements required as a result of the development should be delivered and phased appropriately

        f) Jobs, services, facilities and economic activity that will be provided by the development and the regeneration potential this might provide should inform the design so it maximises the benefits these could bring to the area, and maximises the role of the development as a catalyst for further change in the area

        g) Buildings, including their construction, should not interfere with aviation, navigation or telecommunication, and should avoid a significant detrimental effect on solar energy generation on adjoining buildings.

    3) Environmental impact

        a) Wind, daylight, sunlight penetration and temperature conditions around the building(s) and neighbourhood must be carefully considered and not compromise comfort and the enjoyment of open spaces, including water spaces, around the building

        b) Air movement affected by the building(s) should support the effective dispersion of pollutants, but not adversely affect street-level conditions

        c) Noise created by air movements around the building(s), servicing machinery, or building uses, should not detract from the comfort and enjoyment of open spaces around the building.

    4) Cumulative impacts

        a) The cumulative visual, functional and environmental impacts of proposed, consented and planned tall buildings in an area must be considered when assessing tall building proposals and when developing plans for an area. Mitigation measures should be identified and designed into the building as integral features from the outset to avoid retro-fitting.

Public access

D - Publicly-accessible areas should be incorporated into tall buildings where appropriate, particularly more prominent tall buildings.

We broadly support these principles, which may be more complex and critical to achieve in the case of tall buildings but are generally good practice principles of planning, design and operation. We would therefore stress the importance of robust and multi-disciplinary design reviews – see comments on policy D2.

Our key comments from a technical perspective are as follows:

- *Use of land: it should not be assumed that tall buildings are necessarily the most efficient use of land to provide accommodation, as the footprint taken by structure and services, as well as the space required around them, can become quite significant. Therefore, they should not necessarily be seen as essential to delivering high density.*
- *Environmental impact: a related issue is that tall buildings can result in a significant use of resources for a given floor area (i.e. high embodied impact). We recommend this be examined in more detail as part of monitoring this policy, and in particular that the embodied carbon of tall buildings be monitored – see our response to policy SI-2. In addition, their environmental impact in operation also needs to be considered, for example: the cladding performance on high-rise buildings will typically not be able to achieve the same thermal performance of that of lower-rise buildings, such as masonry; due to wind speeds at high levels, tall buildings will typically require to be mechanically ventilated, limiting the possibility of natural openings for ventilation, comfort, overheating risk mitigation etc. Overall, research being conducted at University College London's Energy Institute suggests that high-rise buildings may incur a significant energy penalty. We would encourage the Mayor to seek detailed input on this issue from UCL. These points do not preclude high-performance tall buildings, but they do mean that proposals should be examined with much scrutiny.*
- *Impact on surroundings: as noted in C-3, tall buildings should not be viewed in isolation nor their impact be considered from an aesthetic and views standpoint only. Guidance already exists to some extent, but the assessments will be quite context- and location-dependent, and it is largely an evolving and specialist field. The impact of buildings on surroundings should therefore be carefully analysed by project teams and scrutinised by planners, for an integrated technical assessment. This is likely to require additional training and/or resources of local authorities. For examples of such strategic considerations, we would refer to city planning by Hong-Kong[10] and Stuttgart[11], which cover tall buildings as well as broader city planning and local- to micro-climate considerations. CIBSE would be happy to collaborate with the Mayor's team on this issue.*
- *Emerging findings of the Independent Review of Building Regulations and Fire Safety: it is important that the Mayor takes full account of the emerging thinking from the review, especially in this area as it is focused on high rise and complex buildings.*

25.   D9 Basement development

26.   D10 Safety, security and resilience to emergency

The Mayor uses his convening power to work with relevant partners and stakeholders to ensure and maintain a safe and secure environment in London that is resilient against emergencies including fire, flood, weather, terrorism and related hazards as set out in the London Risk Register.
A - Boroughs should work with their local Metropolitan Police Service 'Design Out Crime' officers and planning teams, whilst also working with other agencies such as the London Fire and Emergency Planning Authority, the City of London Police and the British Transport Police to identify the community safety needs, policies and sites required for their area and to support provision of necessary infrastructure to maintain a safe and secure environment.
B - Development proposals should maximise building resilience and minimise potential physical risks, including those arising as a result of fire, flood and related hazards. Development should include measures to design out crime that – in proportion to the risk – deter terrorism, assist in the detection of terrorist activity and help mitigate its effects. These

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[10] The Government of the Hong Kong Special Administrative Region, Planning Department, *Hong Kong Planning Standards and Guidelines - Chapter 11 : Urban Design Guidelines*, 2005, last revision 2015
http://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/ch11/pdf/ch11.pdf
[11] City of Stuttgart, Directorate for Urban Development and Environmental Protection, Office for Environmental Protection, *Scripts by the Office for Environmental Protection - No. 1/2009, Environmental aspects in spatial planning in Stuttgart*, April 2009
http://www.stadtklima-stuttgart.de/stadtklima_filestorage/download/AfU-Script-01-2009_E.pdf

measures should be considered at the start of the design process to ensure they are inclusive and aesthetically integrated into the development and the wider area.

Resilience to flood – see more detailed comments in responses to Chapter 9

There is no explicit reference to cybersecurity. In larger buildings with automated control systems there is a requirement to consider this issue. It is understood that due to the nature of this topic what is publicly stated needs to be considered with care. CIBSE would be willing to discuss this in greater detail with the Mayor's team.

On resilience to fire hazard, see response to policy D11

27. D11 Fire safety

A - In the interests of fire safety and to ensure the safety of all building users, development proposals must achieve the highest standards of fire safety and ensure that they:
    1) are designed to incorporate appropriate features which reduce the risk to life in the event of a fire
    2) are constructed in an appropriate way to minimise the risk of fire spread
    3) provide suitable and convenient means of escape for all building users
    4) adopt a robust strategy for evacuation which all building users can have confidence in
    5) provide suitable access and equipment for firefighting which is appropriate for the size and use of the development.
B - All major development proposals should be submitted with a Fire Statement, which is an independent fire strategy, produced by a third party suitably qualified assessor.
The statement should detail how the development proposal will function in terms of:
    1) the building's construction: methods, products and materials used
    2) the means of escape for all building users: stair cores, escape for building users who are disabled or require level access, and the associated management plan approach
    3) access for fire service personnel and equipment: how this will be achieved in an evacuation situation, water supplies, provision and positioning of equipment, firefighting lifts, stairs and lobbies, any fire suppression and smoke ventilation systems proposed, and the ongoing maintenance and monitoring of these
    4) how provision will be made within the site to enable fire appliances to gain access to the building.

*It is important that the Mayor takes full account of the emerging findings of the **Independent Review of Building Regulations and Fire Safety**, especially with regards to high-rise and complex buildings, and those with vulnerable populations.*

*CIBSE is also currently finalising a new edition of **CIBSE Guide E, Fire Safety**, which is due to be published later in Spring 2018.*

28. D12 Agent of Change

29. D13 Noise

A - In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:
    1) avoiding significant adverse noise impacts on health and quality of life
    2) reflecting the Agent of Change principle to ensure measures do not add unduly to the costs and administrative burdens on existing noise- generating uses
    3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on development
    4) improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity)
    5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening or internal layout – in preference to sole reliance on sound insulation
    6) where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles
    7) promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver.

B - Boroughs, and others with relevant responsibilities, should identify and nominate new Quiet Areas and protect existing Quiet Areas in line with the procedure in Defra's Noise Action Plan for Agglomerations.

We are supportive of the intent. We would stress the importance of early design considerations including site layout, location of sensitive uses, source control and design mitigation measures. Many measures can have multiple benefits and contribute to the achievement of other objectives in this plan, such as overheating risk mitigation.

For residential development and early design considerations, we would recommend including a reference to the 2017 Pro-PG[12], jointly produced by the Institute of Acoustics (IOA), the Chartered Institute of Environmental Health and the Association of Noise Consultants (ANC). An additional further reference in the future is the ANC's new residential design guide on acoustics, ventilation and overheating[13], which is currently out for consultation. We would strongly encourage the Mayor's team to liaise with the ANC and IOA, particularly the working group for these two guidance documents.

Chapter 4 – Housing

How best to meet overall housing needs is not within CIBSE's core area of expertise; we are focussed on delivering, operating and maintaining the homes to meet those needs to a high standard.

As a professional institution we would however note that we are very aware of the difficulty to access housing of appropriate quality and costs in London; the building services engineering professions and the wider construction sector have to compete with other industries in attracting and retaining talented, skilled and creative workers. We would welcome measures to ensure that housing costs and availability do not contribute to further skill shortages in the sector.

30. H1 Increasing housing supply
31. H2 Small sites
32. H3 Monitoring housing targets
33. H4 Meanwhile use
34. H5 Delivering affordable housing
35. H6 Threshold approach to applications
36. H7 Affordable housing tenure
37. H8 Monitoring of affordable housing
38. H9 Vacant building credit
39. H10 Redevelopment of existing housing and estate regeneration
40. H11 Ensuring the best use of stock
41. H12 Housing size mix
42. H13 Build to Rent
43. H14 Supported and specialised accommodation
44. H15 Specialist older persons housing
45. H16 Gypsy and Traveller accommodation
46. H17 Purpose-built student accommodation
47. H18 Large-scale purpose-built shared living

Chapter 5 - Social Infrastructure

We are broadly supportive of the objectives, but cannot comment in detail on individual objectives and measures as it is outside our core area of expertise.

*We welcome the reference to **Health and Wellbeing boards**; we note however they are referred to in the context of identifying and responding to health and social care needs. It is our understanding that, as per the Health and Social Care Act 2012, these boards are intended to better support long-term healthcare and public*

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[12] *ProPG: Planning & Noise – New Residential Development*, May 2017 http://www.ioa.org.uk/publications/propg
[13] http://www.association-of-noise-consultants.co.uk/wp-content/uploads/2018/02/AVO-Guide-draft-for-consultation.pdf?dm_i=142S,5GMGN,RK885D,L5RSU,1, February 2018

48. S1 Developing London's social infrastructure
49. S2 Health and social care facilities
50. S3 Education and childcare facilities
51. S4 Play and informal recreation
52. S5 Sports and recreation facilities
53. S6 Public toilets
54. S7 Burial space

Chapter 6 – Economy

55. E1 Offices
56. E2 Low-cost business space
57. E3 Affordable workspace
58. E4 Land for industry, logistics and services to support London's economic function
59. E5 Strategic Industrial Locations (SIL)
60. E6 Locally Significant Industrial Sites
61. E7 Intensification, co-location and substitution of land for industry, logistics and services to support London's economic function
62. E8 Sector growth opportunities and clusters
63. E9 Retail, markets and hot food takeaways
64. E10 Visitor infrastructure
65. **E11 Skills and opportunities for all**

A - The Mayor will work with strategic partners to address low pay and, supported by his Skills for Londoners Taskforce, co-ordinate national, regional and local initiatives to promote inclusive access to training, skills and employment opportunities for all Londoners.
B - Development proposals should seek to support employment, skills development, apprenticeships, and other education and training opportunities in both the construction and end-use phases, including through Section 106 obligations where appropriate. Boroughs should ensure these are implemented in ways that (a) enable trainees to complete their training and apprenticeships, (b) ensure the greatest level of take-up possible by Londoners of the training, apprenticeship and employment opportunities created and (c) increase the proportion of under-represented groups within the construction industry workforce. In partnership with the Mayor, boroughs are encouraged to consider cross- borough working to open up opportunities, including those created via Section 106 obligations, on a reciprocal basis, to residents from adjacent boroughs and across London.

CIBSE response

Apprenticeships are an essential part of ensuring highly-skilled construction workers are available to deliver objectives in terms of volume of construction but also, crucially, quality and sustainability.

We support and welcome the intent to encourage cross-Borough collaboration on this issue. Anecdotal but consistent feedback from construction professionals highlights that the common practice of linking apprenticeships to individual Boroughs can be overly restrictive for companies and individuals, limiting the opportunities for apprenticeships.

Chapter 7 - Heritage and Culture

Chapter 8 - Green Infrastructure and Natural Environment

*We **support the broad objectives** to protect green spaces, promote green infrastructure, and increase urban greening; this can and should play a fundamental part in the Mayor's environmental, health and wellbeing objectives, as highlighted by the World Health Organization's recent review on the impact of urban green spaces[14].*

*We are concerned by the **lack of clear objectives for improvements**, and the **lack of associated monitoring** as part of the Plan's essential KPIs. Our specific comments and recommendations are detailed below.*

*We are also concerned that this chapter does not address maintenance, other than a brief mention under policy G9. We would stress the importance of **budgets and resources for long-term management of green infrastructure and open space**. These should be identified and secured (for example, we understand some local authorities and land owners plan for 50-year budgets). In the case of new developments, this could for example be secured in S106 agreements.*

73.   G1 Green infrastructure

A - London's network of green and open spaces, and green features in the built environment such as green roofs and street trees, should be protected, planned, designed and managed as integrated features of green infrastructure.
B - Boroughs should prepare green infrastructure strategies that integrate objectives relating to open space provision, biodiversity conservation, flood management, health and wellbeing, sport and recreation.
C - Development Plans and Opportunity Area Planning Frameworks should:
    1) identify key green infrastructure assets, their function and their potential function
    2) identify opportunities for addressing environmental and social challenges through strategic green infrastructure interventions.

CIBSE response

We strongly support the integration of green infrastructure (GI) in urban environments.

Green infrastructure and open spaces can contribute to a number of environmental, health, wellbeing and resilience policies in this Plan, and we have also made specific comments on these policies where appropriate, including GG6 (adaptation and resilience), SI1 (air quality) and SI5, SI12 and SI13 (water management, flood risk and drainage).

We understand from the draft Environment Strategy that GI is intended by the Mayor's team to also encompass blue infrastructure too (also jointly referred to as blue-green infrastructure).

*This is a truly **multi-disciplinary area which requires a whole-systems approach**, providing an opportunity for London to demonstrate national and international leadership. We would encourage a robust long-term strategy, with **clear objectives which are not dependent on short-term electoral cycles**. We acknowledge that this is to some extent the case with objectives for 2050, but we do not think these are robust enough (they are not set in policy) nor ambitious enough, and we would welcome intermediate targets and monitoring requirements.*

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[14] WHO, *Urban Green Spaces and Health – A Review of Evidence*, 2016

We would encourage the Mayor's team to collaborate with and learn from initiatives abroad (e.g. regional green infrastructure plans in southern Spain or Louisiana), with information available through networks such as C40, ICLEI and the Global Covenant of Mayors, as well as from the UK, for example the Blue Green framework[15] developed by Imperial College with support from Climate-KIC.

*We also recommend the formation of a **task group** with the ability to cross over and influence the GLA group operations where appropriate, to cover responsibilities including (but not restricted to): air quality; resilience and climate change adaptation; design (including urban design and micro-climates); carbon reduction; flood risk and water management; biodiversity; health and wellbeing. This should also include key parties from academia, industry and the professional institutions such as the Landscape Institute, RIBA, CIAT, CIRIA, CIBSE and its Resilient Cities Group. One of the first tasks of the group would be to review and update the All London Green Grid document and provide guidance to the Boroughs, as noted below.*

G1-A: *We support the policy to protect London's green and open spaces and green features in the built environment. We also support the intent to see that as part of overall planning, designing and management of green infrastructure, in a whole-system approach rather than as isolated elements. We would note that in addition to the benefits already listed in the policy, open spaces can also contribute to the provision of segregated cycle routes to support greener transport and reduced emissions from vehicles.*

G1-B & C: *We support the policy that Boroughs should prepare green infrastructure (GI) strategies which recognise the multiple functions that can be provided by GI and which incorporate a range of objectives, including open space, biodiversity, flood, air quality etc. These will be much more effective as part of a regional strategy, and therefore we stress the importance for the Mayor to provide guidance and to review the All London Green Grid and update it if needed – see our comments above on the creation of a task group.*

§8.1.2: *We welcome the recognition of GI's **economic and social value**, with the mention of tools such as i-Tree, as they can be powerful in highlighting the multiple functions and benefits that can be provided by green infrastructure. We would however stress that these tools are still in early stages and do not necessarily account for all factors – for example, notably, i-Tree does not take account of mental health and wellbeing benefits.*

§8.1.3: ***"London at least 50 percent green by 2050"*** *is referred to as a manifesto commitment, but not in the policy itself; **this is a somewhat unclear status.** Having a **clear policy objective, with regular monitoring and reporting**, would send a much stronger message to local authorities, land owners and developers - see also our response to policy G5 and to Chapter 12 – Monitoring. This is particularly important given the ambitious targets set in other policies of this Plan, including housing density, which could otherwise conflict with GI and natural environment objectives. Best practice examples of how these objectives can be jointly achieved would be useful, as also highlighted in our response to policy D6.*

*See also overall chapter comment on **maintenance**.*

74. G2 London's Green Belt

75. **G3 Metropolitan Open Land**

CIBSE response

We support the policy to protect London's open land in recognition of its multiple functions, including leisure and sports facilities, transport, biodiversity, flood risk management and mitigation of the urban heat island effect.

76. **G4 Local green and open space**

A - Local green and open spaces should be protected.

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[15] http://bgd.org.uk/

B - The creation of new areas of publicly-accessible green and open space should be supported, especially in areas of deficiency in access to public open space.

C - Boroughs should undertake a needs assessment of local green and open space to inform policy. Assessments should identify areas of public green and open space deficiency, using the categorisation set out in Table 8.1 as a benchmark for all the different types required105.

D - The loss of green and open spaces should be resisted in areas of deficiency. If losses are proposed outside of areas of deficiency, equivalent or better quality provision should be made within the local catchment area unless an up-to-date needs assessment demonstrates this is unnecessary.

E - Development Plans and Opportunity Area Frameworks should:
  1) include appropriate designations and policies for the protection of green and open space to address deficiencies
  2) ensure that future green and open space needs are planned for in areas with the potential for substantial change
  3) ensure that green and open space needs are planned in line with objectives in green infrastructure strategies in order to deliver multiple benefits and in recognition of the cross-borough nature of some forms of green infrastructure.

CIBSE response

*We support the policy to protect London's local green and open space in recognition of its multiple functions, including leisure and sports facilities, transport, biodiversity, flood risk management and mitigation of the urban heat island effect. In particular, we would highlight their importance in supporting the Mayor's **health and wellbeing** objectives, as small but local and accessible green open space can significantly support healthy and active lifestyles. This is also important for the Mayor's objective to reduce **health inequalities**, as areas with less access to green open space also tend to be those less affluent[16].*

*See also overall chapter comment on **maintenance.***

77. G5 Urban greening

A - Major development proposals should contribute to the greening of London by including urban greening as a fundamental element of site and building design, and by incorporating measures such as high-quality landscaping (including trees), green roofs, green walls and nature-based sustainable drainage.

B - Boroughs should develop an Urban Greening Factor (UGF) to identify the appropriate amount of urban greening required in new developments. The UGF should be based on the factors set out in Table 8.2, but tailored to local circumstances. In the interim, the Mayor recommends a target score of 0.4 for developments that are predominately residential, and a target score of 0.3 for predominately commercial development.

CIBSE response

*We support the intent of urban greening and welcome the attempt to introduce a measurable objective to monitor progress; we cannot comment at this stage on the proposed approach using UGF, nor on the recommended target score of 0.4. It would be useful to understand the rationale behind this recommended target score, why a lower score is expected of commercial developments than of residential developments, and how the individual Borough UGF scores are expected to fit within the Mayor's overall manifesto commitment of ""**London at least 50 percent green by 2050"** (policy G1).*

*For this policy to be effective, it should be linked to **monitoring requirements** at a development and Borough level – see our response to Chapter 12 – Monitoring.*

*While we cannot comment on the details of the UGF proposals, we would recommend methods that particularly reward **accessible and visible green space**, to maximise their benefits for health and wellbeing.*

As noted in our introduction to this chapter, vegetation can have benefits for air quality, and would therefore contribute to the delivery of policy SI1.

*See also overall chapter comment on **maintenance.***

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[16] Public Health England and UCL Institute of Health Equity, *Local Action on Health Inequalities: Improving Access to Green Spaces*, 2014

78.   G6 Biodiversity and access to nature

A - Sites of Importance for Nature Conservation (SINCs) should be protected. The greatest protection should be given to the most significant sites.
B - In developing Development Plan policies, boroughs should:

1) use the relevant procedures to identify SINCs and green corridors. When undertaking comprehensive reviews of SINCs across a borough or when identifying or amending Sites of Metropolitan Importance boroughs should consult the London Wildlife Sites Board

2) identify areas of deficiency in access to nature (i.e. areas that are more than 1km walking distance from an accessible Metropolitan or Borough SINC) and seek opportunities to address them

3) seek opportunities to create habitats that are of particular relevance and benefit in an urban context

4) include policies and proposals for the protection and conservation of priority species and habitats and opportunities for increasing species populations

5) ensure sites of European or national nature conservation importance are clearly identified and appropriately assessed.

C - Where harm to a SINC (other than a European (International) designated site) is unavoidable, the following approach should be applied to minimise development impacts:

1) avoid adverse impact to the special biodiversity interest of the site

2) minimise the spatial impact and mitigate it by improving the quality or   management of the rest of the site

3) seek appropriate off-site compensation only in exceptional cases where the benefits of the development proposal clearly outweigh the biodiversity impacts.

D - Biodiversity enhancement should be considered from the start of the development process.
E - Proposals which create new or improved habitats that result in positive gains for biodiversity should be considered positively, as should measures to reduce deficiencies in access to wildlife sites.

CIBSE response

*We cannot comment on measures in detail but support the overall objectives for biodiversity protection and enhancement. We would welcome **stronger policies and clear objectives for biodiversity enhancements, linked to monitoring as part of the Plan's KPIs** – see also our response to Chapter 12 – Monitoring.*

*See also overall chapter comment on **maintenance.***

79.   G7 Trees and woodlands

A - Trees and woodlands should be protected, and new trees and woodlands should be planted in appropriate locations in order to increase the extent of London's urban forest – the area of London under the canopy of trees.
B - In their Development Plans, boroughs should:

1) protect 'veteran' trees and ancient woodland where these are not   already part of a protected site

2) identify opportunities for tree planting in strategic locations.

 C - Development proposals should ensure that, wherever possible, existing trees of quality are retained. If it is imperative that trees have to be removed, there should be adequate replacement based on the existing value of the benefits of the trees removed, determined by, for example, i-tree or CAVAT. The planting of additional trees should generally be included in new developments – particularly large-canopied species which provide a wider range of benefits because of the larger surface area of their canopy.

CIBSE response

We support the overall objectives for retaining existing trees of quality, and for additional trees to be included in new development.

There is a risk that, because this is not mainstream construction activity, has ongoing maintenance implications, and requires specialist input, this policy objective will be vulnerable to cost cutting from various parties. The Plan needs to safeguard against this.

*We note the Mayor's **intent to increase tree cover by 10% by 2050**, but as this is in the supporting text rather than policy G7 itself, the status of this target is unclear. For the intent to be more likely delivered, it should be a **clear policy objective, linked to monitoring as part of the Plan's KPIs**. See also our response to Chapter 12 – Monitoring. In many areas of London, we also think there should be a **much more ambitious target than a 10% increase by 2050**, which seems to lack ambition in itself and in light of the Mayor's objectives for health and*

wellbeing, air quality, climate change adaptation etc.

As noted in our introduction to this chapter, planting can have benefits for air quality, and would therefore contribute to the delivery of policy SI1; in the case of trees, this is largely and overall the case, as highlighted for example by the i-Tree assessment[17], although care is needed on location to avoid trapping pollutants, typically in the case of a dense continuous tree canopy over narrow trees with vehicular traffic[18]. This should be particularly reviewed in the case of local Air Quality Action Zones, both to avoid local trapping of pollutants and, for example, for the creation of tree planting in traffic-free "filtered streets".

*See also overall chapter comment on **maintenance**. Tree planting can have poor success rates due to the lack of or inappropriate management, common after the 1st year.*

*As noted in our response to G1, we welcome the recognition of trees' **economic and social value**, but would stress that tools such as i-Tree and CAVAT are still in early stages and do not necessarily account for all factors – for example, notably, i-Tree does not take account of mental health and wellbeing benefits.*

§ 8.7.2: *We welcome and support the reference to guidance from the Trees Design and Action Group (TDAG), and would refer to the response submitted by this group for more detail on this policy. We would stress the importance of referring to specialist guidance such as that of TDAG to benefit from lessons learnt, follow best practice, ensure multi-disciplinary approaches, and address misconceptions about the **integration of trees in streets and their interaction with utilities**. Following such best practice guidance can also bring other significant benefits, such as reducing street works and associated noise, disruptions, costs etc.*

80.   G8 Food growing

81.   G9 Geodiversity

Chapter 9 - Sustainable Infrastructure

82.   SI1 Improving air quality

A - London's air quality should be significantly improved and exposure to poor air quality, especially for vulnerable people, should be reduced:
   1) Development proposals should not:
      a) lead to further deterioration of existing poor air quality
      b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits
      c) reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality
      d) create unacceptable risk of high levels of exposure to poor air quality.
   2) Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality. Particular care should be taken with developments that are in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people.
   3) The development of large-scale redevelopment areas, such as Opportunity Areas and those subject to an Environmental Impact Assessment should propose methods of achieving an Air Quality Positive approach through the new development. All other developments should be at least Air Quality Neutral.
   4) Development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.
   5) Air Quality Assessments (AQAs) should be submitted with all major developments, unless they can demonstrate that transport and building emissions will be less than the previous or existing use.
   6) Development proposals should ensure that where emissions need to be reduced, this is done on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated.

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[17] I-Tree, *Valuing London's Urban Forest - Results of the London i-Tree Eco Project*, 2016
[18] Trees Design and Action Group, *Trees in Hard Landscapes – A Guide for Delivery*, 2014 http://www.tdag.org.uk/trees-in-hard-landscapes.html

*We support the overall intent to improve air quality. We would however note that the **policy appears to be a significant downgrade in aspirations, compared to the draft Environment Strategy:***

*The proposed policy wording focuses on "improvements" and avoiding "further deterioration", without **clear and measurable objectives.** Furthermore, the only threshold referred to is legal compliance; we would stress that UK legal air quality objectives do not entirely follow EU objectives and, more importantly, they are less onerous than recommendations from the World Health Organization (WHO) - the following table highlights key such occurrences. We would strongly support a policy that would align with the proposals in the Environment Strategy, i.e. **air quality targets in line with WHO guidelines**. This was also recommended by NICE in recent guidelines, at least within clean air zones[19]. Given the current state of air quality in London there is a real and urgent need for improvement in air quality and the Plan needs to set this out clearly and unambiguously.*

Pollutant	WHO guidelines[20]		UK Air Quality Objective[21]	Comments
NO2	annual average	$40\mu g/m^3$	$40\mu g/m^3$ by end 2005	*Note also the WHO state there is "no evidence for an exposure threshold"[22]; it is therefore recommended to reduce exposure levels as much as possible, rather than the guideline levels being seen as "safe"*
	1-hour average	$200\mu g/m^3$	$200\mu g/m^3$ not to be exceeded more than 18 times a year, by end 2005 i.e. marginally less onerous than WHO recommendation	
PM10	annual average	$20 \mu g/m^3$	- UK: $40 \mu g/m^3$ by end 2004 i.e. **the UK objective is 2 times the WHO recommendation** - Scotland: $18 \mu g/m^3$ by end 2010	*Note also the WHO have not identified thresholds, and instead the guidelines are produced for the purpose of standard-setting on the basis of risk assessments and public health priorities, but authorities are encouraged to adopt increasingly stringent limits[20].*
	24-hour average	$50 \mu g/m^3$	- UK: $50 \mu g/m^3$ not to be exceeded more than 35 times a year, by end 2004 - Scotland: $50 \mu g/m^3$ not to be exceeded more than 7 times a year by end 2010 i.e. marginally less onerous than WHO recommendation	
PM2.5	annual average	$10 \mu g/m^3$	- England, Wales, and Northern Ireland: $25 \mu g/m^3$ by 2020 i.e. **the objective is 2.5 times the WHO recommendation** - Scotland: $10 \mu g/m^3$ by end 2020 - UK urban areas: 15% reduction in concentrations at urban background between 2010 and 2010	
	24-hour average	$25 \mu g/m^3$	*None i.e. **the WHO recommendation is not addressed***	

SI1-A-3 Demolition and Construction

We welcome the attention to this source of emissions. Non-road vehicles and equipment can significantly contribute to noise and air pollution in urban areas, and a switch to electric or hybrid models could therefore bring significant benefits; they are typically un-used at night, therefore being able to be charged at night during periods of lower demand. Electric construction vehicles, machinery and equipment should be more strongly

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[19] https://www.nice.org.uk/guidance/ng70/chapter/Recommendations , paragraph 1.3.1
[20] WHO, *Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, Global update 2005, Summary of risk assessment, 2006*
[21] https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf
[22] WHO Regional Office for Europe, *WHO guidelines for indoor air quality: selected pollutants, 2010*

encouraged, with the overall objective to eradicate diesel use. This is already the case on some construction sites, thanks to early discussions between developers, contractors and utilities to ensure a grid connection throughout construction. This would have significant benefits in reducing air pollution and noise exposure both for site workers and neighbouring populations.

Whilst it is anticipated that the latest changes to the EU Energy Performance of Buildings Directive will include requirements relating to electric vehicle charging, this will not extend to construction sites. The Mayor may wish to consider specific requirements whilst having regard to the potential constraints of delivering charging facilities on some sites with limited existing infrastructure (e.g. green field sites).

Best practice case studies could be gathered; we would point to the London Low Emission Construction Partnership (funded by the GLA)[23] and the work of leading London boroughs such as the City of London as useful references.

SI1-A-3 Air Quality Positive and §9.1.9 Guidance

*The draft Environment Strategy proposed to monitor the impact of measures to improve air quality; we would stress this is crucial if the policy objective of **Air Quality Positive** developments is going to be achieved – for example, to better understand the impact of green infrastructure or transport policies.*

*We welcome the Mayor's intent to provide **more guidance** – as for other policies, **examples of best practice** can be really useful, particularly when objectives may otherwise be seen to conflict with others (e.g. it would be particularly useful to show examples of co-benefits, where good design helps reduce exposure to air quality as well as noise and overheating risk, and examples of low-carbon and low-pollution heating strategies). CIBSE would be well-placed and happy to collaborate with the Mayor on this.*

*We would welcome a reference to the synergies with other policies, including G1 on **green infrastructure,** G5 on **urban greening** and G7 on **trees**, as these can offer benefits in air quality terms, as highlighted for example by a recent World Health Organization review on urban green spaces[24] and the recent iTree assessment for London[25]. See also our response to Chapter 8 on the need for a whole-systems approach to green infrastructure.*

SI1-A-5 Air Quality Assessments (AQA)

*Air Quality Assessments often focus on assessing the impact on external air quality; their value could be improved if they were used to **inform design proposals**, with more attention given to mitigation measures for reducing exposure and reducing emissions, in collaboration with other disciplines. We therefore welcome §9.1.4 which encourages major developments to carry out preliminary AQAs.*

AQAs should take account of the local urban form, including local wind patterns and massing, particularly in high rise areas. CFD modelling and methods such as those used in Singapore and Hong Kong to look at increasing airflow in urban canyons could be applied to help disperse pollution (these also being investigated in other cities such as Helsinki or Beijing). This is also linked to policies D1 – Design and D8 – Tall buildings.,

*Furthermore, we would encourage AQAs to consider not only the impact on the surrounding ambient air quality, but also **exposure of the future building occupants** – see also comments further down on indoor air quality.*

*The current policy wording does not set in place any method by which to ensure **compliance with the recommendations of the Air Quality Assessment.** This should be addressed, including **post-completion verification** of measures such as emissions from major emission sources and verification of indoor air quality limits (see further comments on indoor air quality and post-completion below). What gets measured and*

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[23] www.llecp.org.uk/
[24] WHO, *Urban Green Spaces and Health – A Review of Evidence*, 2016
[25] I-Tree, *Valuing London's Urban Forest - Results of the London i-Tree Eco Project*, 2016

verified against tangible, measurable targets is more likely to be delivered.

*It is debatable whether **size of development** should determine whether an AQA is required. First of all, small-scale sources can result in a significant cumulative impact, as illustrated by the fact that, according to Defra, "domestic burning of house coal, smokeless solid fuels and wood is the single largest source of harmful particulate matter emissions in the UK, at around 40% of the total in 2015"[26]; the importance of wood burning on polluting emissions specifically in London and UK cities has also been shown by recent studies[27]. For smaller developments, we think the requirement for an AQA could also be triggered by risk factors such as average ambient pollution in the local area, or risk profile of the future building occupiers (e.g. housing, care homes, schools). A risk-based trigger would be more appropriate than a size-based trigger. Proximity to major roads or other sources of pollution such as local generators should be considered as material risks as a minimum.*

*A suggestion for major developments is that, instead of air quality being covered simply as part of the EIA, it should be addressed in an **'Air Quality Strategy'** document, with similar profile and status as Energy Strategies. This should be a broader multi-disciplinary document with architect, Mechanical & Electrical engineer and Air Quality Specialist input, which would lead to significantly improved coordination between these key disciplines. It should contain at least the following information:*

- *__Targets__ for air quality for the site, based on WHO limits and any site specific situations; these should include indoor air quality targets, and targets of polluting emissions.*
- *__Strategy__ for meeting those targets, including specification of plant such as boilers, CHP etc, location of flues, opening requirements, filtration specification, provision of user guides, etc. Consideration should also be given to long-term ventilation plans so that, for example, if a development is currently proposed to be mechanically ventilated to allow high-level air inlets and filtration of the outdoor air, it may still have the capacity to be naturally ventilated in the future as London starts meetings its air quality objectives.*
- *Requirements for __maintenance and operation__ to ensure that the system actually delivers what it is intended to (see below)*
- *Proposals for __post construction monitoring__ (see below).*

The key benefit of this document would be enabling councils and the GLA to produce guidance similar to energy strategy documents, and have a number of key metrics they could view to ensure compliance with policy. The on-site and off-site elements of air quality improvement would therefore be much more visible, and the requirement to meet the policy could be conditioned based on the air quality strategy document they present. CIBSE are well-placed and would be happy to collaborate with the GLA on this.

<u>*Post-completion*</u>

*We recommend that **post occupancy testing** should be conducted on sample areas, particularly in uses such as residential developments and schools (e.g. 10% of apartments in a residential development, as for acoustics testing, or a percentage of floorplate in commercial buildings), with heating plant in full operation to ensure emissions from plant meet the required standards and indoor air quality standards meet recommended limits (i.e. WHO guidelines).*

***Operation & Maintenance manuals and building user guides** should include a section on air quality to ensure occupants are aware of any systems in place to protect them from poor outdoor air, and the proper maintenance of those systems (e.g. filter class, replacement periods, etc.)*

<u>*§9.1.6 Generators*</u>

We agree that AQAs should include consideration of emergency generators, as their impacts on local air quality were highlighted by DEFRA in December: "domestic energy market incentives are leading to an increase in high NOx (oxides of nitrogen) emission generators, which (…) have the potential to exceed the Gothenburg 2020 NOx emission ceiling and hourly NO2 (nitrogen dioxide) limits set in the EU Ambient Air Quality Directive".

[26] Defra, *Call for evidence on the domestic burning of wood and coal,* February 2018 https://consult.defra.gov.uk/airquality/domestic-burning-of-wood-and-coal/

[27] https://uk-air.defra.gov.uk/assets/documents/reports/cat05/1801301017_KCL_WoodBurningReport_2017_FINAL.pdf

Beyond air quality issues, they are also a high-carbon way to generate electricity, and their operation therefore also potentially jeopardises carbon emissions reduction targets.

New regulation is coming into force to implement the Medium Combustion Plant Directive[28], which will place further restrictions on generators including a maximum limit of 50 annual hours of operation for plant to be classified as back-up plant – the same limit (or lower) should be followed in London, and it should be incorporated in planning conditions and monitored. Limits to operating hours can be difficult to enforce and monitoring compliance is crucial, as highlighted by the Institute for Air Quality Management[29], so this should be given appropriate resources and be carried out in liaison with Defra's permitting department.

It should also be noted that, in the first few years, the new regulatory restrictions will only apply to new plant and an assessment by Defra has concluded that transposing the MCP alone would "not adequately address the risks these generators pose to air quality and to our compliance" with NOx level objectives, and therefore that "additional regulation is needed and quick action required to avoid further rapid increases in NOx emissions from generators." Defra therefore recommend the introduction of additional emission controls to address the growth in emissions from high-NOx emitting generators[30]. We therefore recommend that the Mayor of London should consider additional measures, including how to treat existing generator plant to improve emissions and/or limit operating hours. Emission control options, including technological abatement, have been assessed by Defra[30].

SI1-A-6 and §9.1.9 Off-site measures and offset payments

We appreciate that in some cases, project constraints will limit the extent of possible on-site measures, and off-site measures and/or offset payments may be the most appropriate route to deliver overall improvements and to target other areas which are not subject to development. We would however note the following, based on experience in carbon offsets:

- *Offsetting strategies often **over-estimate future potential benefits**, compared to the actual delivered benefits which in practice rely on good design, implementation, and management. This is the case for carbon offsets and we would encourage similar caution in the case of air quality proposals: for example, urban tree planting often has low success rates, caution should be applied if assuming that a "potential future tree" will deliver improvements in pollutant concentrations. Furthermore, a number of measures are known qualitatively to offer benefits, but their quantification is still subject to evolving knowledge – this is the case for example for a number of green infrastructure measures, or urban design approaches to pollutant dispersion. We would recommend that off-site measures be limited to known, established measures in the first few years, while knowledge on other potential measures improves (see also our previous point in this section on the importance of monitoring the impact of measures put in place, in order to gather lessons on what works).*
- *Carbon offsetting strategies can be costly and time-consuming to manage, and it is now recognised that **London boroughs would benefit from guidance** to deliver carbon savings in practice. This lesson should be taken into account if air quality offsetting is proposed.*
- *Air quality emissions are a much more localized problem than carbon emissions, and where improvements are carried out is therefore much more important. Applying off-site measures should take this into account to ensure that air quality is improved in areas where it is most needed.*

Indoor air quality

*While the policy mentions reducing exposure, it seems very focused on external air quality. We would welcome clearer guidance on objectives for **indoor air quality**, given that current regulations, including Building*

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[28] Environmental Permitting (England and Wales) (Amendment) Regulations 2018
https://www.legislation.gov.uk/ukdsi/2018/9780111163023/pdfs/ukdsiem_9780111163023_en.pdf, and accompanying Explanatory Memorandum, 2018 https://www.legislation.gov.uk/ukdsi/2018/9780111163023/pdfs/ukdsiem_9780111163023_en.pdf
[29] http://www.iaqm.co.uk/text/position_statements/aq_impacts_of_STOR_facilities_interim.pdf
[30] https://consult.defra.gov.uk/airquality/medium-combustion-plant-and-controls-on-generators/supporting_documents/Generator%20EA%20air%20dispersion%20modelling%20report.pdf

Regulations, do not provide a comprehensive framework to address this, and given the time it will take to achieve objectives for external air quality. For this purpose we would recommend, as for outdoor air quality objectives, referring to WHO guidelines.

If air filtration is used in the development to comply with indoor air quality standards, there should be pre-occupancy testing to confirm suitable operation, and information must be provided to the future occupiers on the type of air filtration used, its location and how to operate and maintain it. If filtration is used, applicants should confirm that it has been taken into account in energy and carbon calculations (policy SI2) - this is often not the case, particularly in the case of SAP calculations where fan efficiencies in Mechanical Ventilation with Heat Recovery very often do not take account of filters.

See also responses to policy SI3 and to the Transport chapter; we would also like to refer to our response to the London Environment Strategy, November 2017.

Overall comment

CIBSE provide a number of guidance documents on this issue, including TM21 on the location of air intakes and the upcoming revised Technical Memorandum 40 on Health & Wellbeing; we would welcome reference to CIBSE in the supporting guidance, and would be happy to collaborate with the Mayor's team to ensure the Mayor's guidance reflects best professional practice.

83. SI2 Minimising greenhouse gas emissions

A - Major development should be net zero-carbon. This means reducing carbon dioxide emissions from construction and operation, and minimising both annual and peak energy demand in accordance with the following energy hierarchy:
   1) Be lean: use less energy and manage demand during construction and operation.
   2) Be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly. Development in Heat Network Priority Areas should follow the heating hierarchy in Policy SI3 Energy infrastructure.
   3) Be green: generate, store and use renewable energy on-site.

B - Major development should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy and will be expected to monitor and report on energy performance.

C - In meeting the zero-carbon target a minimum on-site reduction of at least 35 per cent beyond Building Regulations is expected *(this refers to Building Regulations 2013. If these are updated, the policy threshold will be reviewed)*. Residential development should aim to achieve 10 per cent, and non-residential development should aim to achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided:
   1) through a cash in lieu contribution to the relevant borough's carbon offset fund, and/or
   2) off-site provided that an alternative proposal is identified and delivery is certain.

D - Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver greenhouse gas reductions. The operation of offset funds should be monitored and reported on annually.

CIBSE response

Please also refer to our response to the London Environment Strategy, November 2017.

We welcome the overall ambition for zero-carbon buildings.

Reducing carbon emissions from buildings is essential for the UK to meet the requirements of the Climate Change Act. The Committee on Climate Change recently highlighted that progress in reducing carbon emissions from the buildings sector had stalled, and it has recommended tightening carbon standards for new-build and existing buildings[31]. The London Plan would therefore be in line with these recommendations, and demonstrate leadership by adopting measures beyond regulatory compliance.

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[31] Committee on Climate Change, *An independent assessment of the UK's Clean Growth Strategy: From ambition to action*, January 2018 https://www.theccc.org.uk/publication/independent-assessment-uks-clean-growth-strategy-ambition-action/

Current Building Regulations (Regulation 25B) already incorporate a requirement for new buildings to be "nearly zero energy", but this only comes into force in January 2021 and may be subject to amendment prior to coming into force.

The EU has now agreed the text of the third edition (whatever it will be formally called) of the Energy Performance of Buildings Directive, and this is due to be published shortly. This may introduce further requirements, although these will be subject to the ongoing negotiations between the UK and the EU.

Beyond the above broad principles, we would make the following key recommendations:

- *There is a far-reaching consensus that **the approach in the existing London Plan, focusing on carbon emissions targets against Building Regulations Part L, does not deliver sufficient reductions in carbon emissions** in practice.*
- *There is a very strong consensus that the current **metrics for energy and carbon policy** (i.e. based on Building Regulations Part L) are <u>not</u> adequate to deliver carbon savings. The calculations carried out under Part L are for compliance purposes and do not take account of operational realities. They only cover regulated emissions (with unregulated emissions often a very significant part of the total actual emissions), are not necessarily a representation of actual occupation conditions and therefore not a representation of operational performance, and are linked to a carbon emissions factor for the electricity grid which is very much out of date, potentially leading to decisions with detrimental long-term carbon outcomes.*
- *There is a growing consensus that policies should introduce **energy metrics either on their own or in combination with carbon metrics; this should be absolute (i.e. kWh/m^2) rather than expressed as relative improvements over a target**[32]. We are aware that at this stage the Mayor's policies have to some extent to be linked to the current system, i.e. Building Regulations and regulated carbon metrics. Therefore as a first stage in the immediate term, we recommend that **applicants should be required to report on energy metrics**, allowing the GLA to gather information and ultimately inform a modification of policy; we think this should differentiate between different energy sources (gas, electricity…), either by providing a breakdown or by the use of primary energy.*
- *We would strongly encourage a transition to policy targets based on **operational outcomes**, rather than on design and practical completion estimates. In particular, we think this should be clearly stated in the overall objective of "zero-carbon city by 2050", and an intermediate objective should be introduced for all **major new development to be zero carbon in operation by 2030.** Such a target is broadly consistent with the objective of ALL existing housing being at least C-rated by 2030, as set out in the Clean Growth Strategy. Setting an ambitious target NOW will enable industry and stakeholders to develop realistic options to meet the target.*
- *Once policy has moved to operational outcomes, and thanks to the policy requiring monitoring in operation, failures in delivering the expected carbon performance could be captured, for example, at the same tariff as carbon offsets (since effectively, the initial carbon offset of these developments would have been insufficient).*

*We are aware that while the intention of the London Plan is for carbon reduction targets to apply in **major refurbishments** which are subject to planning applications, this is often not the case in practice. Many such refurbishments are extensive (often, wholesale replacement of the façade and building services), and they therefore offer substantial opportunities for carbon reduction. There are significant energy and carbon saving opportunities from these refurbishments, which could also contribute to reduced air polluting emissions (policy SI1) through reduced fuel consumption. Guidance should be clearer that the **carbon targets do apply** for these planning applications, and implementation should be more consistent. There is also a need for better co-ordination of these projects with the Building Regulations requirements for refurbishment projects. We believe that the revisions to the EPBD do address refurbishment.*

*We would also highlight the work carried out by the **London Energy Transformation Initiative (LETI),** which gathers the views of a large number of professionals from a wide range of backgrounds. We would refer the*

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[32] A powerful example of what an approach focused on kWh/m2 metrics can achieve is Passivhaus.

Mayor to the recommendations of the group[33], which CIBSE broadly support, and would encourage the Mayor's team to continue liaising with LETI to develop detailed proposals. CIBSE are involved with LETI, and we would also be very happy to collaborate with the Mayor on this.

SI2-A Energy hierarchy and SI2-C on-site emissions and carbon offsets

*We continue to support the application of the **energy hierarchy**, with passive design and energy efficiency as the first step. Passive design is a crucial component for energy and carbon reduction as well as operational costs and reducing the risk of fuel poverty – we would welcome a specific mention of it within SI2 – C, alongside energy efficiency.*

*While **carbon offsets** offer flexibility to constrained sites and help create budgets for carbon savings in existing buildings, we are aware that the carbon reductions delivered in practice are often lower than anticipated. This is due to a combination of factors, including the difficulty of estimating future savings and the management of carbon offset budgets. We welcome the Mayor's intent to support individual London boroughs on this, to ensure consistency of approaches and effective management of the funds.*

*Carbon offset funds should be used to deliver projects that are otherwise not financially viable (e.g. long returns on investments, lower-income residents), and where the use of these funds allows economies of scale (e.g. street-wide energy retrofit programmes). We would welcome strategic thinking on this issue so that the potential of offset funds is unlocked to deliver **substantial carbon reduction through energy retrofits.** We would note that in many cases, this could also help deliver other objectives of this Plan, including health benefits and reduction of health inequalities, as well as improved air quality through reduced fuel consumption. We would be very happy to collaborate with the Mayor's team on this.*

SI2-A Emissions from construction and §9.210k Embodied carbon

We understand the Mayor of London wants to progress towards a more holistic and comprehensive carbon reduction strategy, which would address embodied as well as operational carbon. We support this objective.

We would however highlight that embodied carbon assessments are still in early stages of adoption in the market, with a lack of consensus on various aspects of the methodology, limited skills across the industry, and still much uncertainty in some areas. We very much support attention to this topic in order to develop knowledge and capacity and to collect data, but we do not think the industry is at a stage where an embodied carbon target should be set. A firm target would not be reasonable, fair across a range of developments, and well-informed, therefore we do not think it should be included within the "net zero carbon" target at this stage.

*We would note that the recently published guidance from the RICS[34] for estimating whole life carbon emissions, which is likely to be used in most assessments, does not mandate the use of appropriate operational energy metrics; in many cases it is likely that Part L figures would be used, which would significantly underestimate operational energy and emissions. This may in turn bias decisions about constructed form and materials to be used on a project: there is a risk that, due to uncertainties in embodied carbon estimates, linking operational and embodied carbon within a single target could have significant unintended detrimental consequences, with embodied carbon estimates being used to avoid measures that would actually reduce operational and whole-life carbon (e.g. more insulation, better specification glazing, shading elements). We would **strongly recommend amending the wording of SI2-A** to make this clear i.e. removing "from construction" so that only emissions in operation are included in the net zero carbon policy.*

*Giving the importance of reducing whole life carbon and improving the industry's knowledge and awareness of the issue, we would recommend that **embodied carbon assessments be requested of major new developments**, submitted **at the planning stage** and with a requirement to **update the information at practical completion, based on as-built information**. We would stress this as important because the impact of*

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[33] https://www.leti.london/
[34] RICS, 2017 http://www.rics.org/uk/knowledge/professional-guidance/professional-statements/whole-life-carbon-assessment-for-the-built-environment-1st-edition/

architectural details and of the supply chain on embodied carbon is significant, and there can typically only be limited information on this at the planning application stage.

This could be carried out for an initial period of a few years (to cover a reasonable number of planning-to-completion buildings) in order to gather information and data on a range of projects, different methodologies, the importance of various assumptions, key influencing factors in the design and construction etc. The information should then be reviewed by the Mayor's team for the potential broadening of the requirement to all developments, and for the setting of targets. To maximise the benefits to the industry, the information could be made available to the industry, for example as an anonymised repository. It could differentiate between uses and building types (e.g. commercial, residential; shell & core vs fully fitted; new build vs refurbishments) and, importantly, high-rise developments as this could build information on the potential environmental impact of tall buildings – see also comments in policy D8.

We would also note that the RICS guidance previously mentioned does not mandate accounting for embodied energy and carbon in __demolition__. We think this should be included as it could significantly alter the embodied assessment of many developments. Whilst this has been a controversial topic in the development of the relevant European Standards, it is an important consideration.

*CIBSE and its members are active in this area and recently published guidance under CIBSE TM56 "Resource efficiency of building services", 2014. We would welcome **collaborating with the Mayor's team** on this, including the **production of supplementary guidance** for the application of this policy.*

SI2-B Energy strategies, § 9.2.10 Energy Strategies information and § 9.2.9 Online portal – Reporting and Monitoring

*We very much welcome the intent to require major developments to **monitor and report on performance.** Transparency and disclosure of operational outcomes can be a strong driver for improvements. As a notable example, we would point to the success of the NABERS approach in Australia in allowing better prediction of actual performance __and__ driving a demand for better performance; this is particularly relevant to the speculative landlord-led commercial office development. To elevate the status of monitoring and reporting, this could be described as the 4th step in the energy hierarchy in SI2-A i.e. "be lean, be clean, be green, be seen".*

We recommend that reporting requirements should apply to individual buildings and also, separately, to the performance of district energy schemes, as these can be under the responsibility of different parties – see also more details below on 9.2.9, and response to policy SI3.

__§ 9.2.9 :__ We note the supporting text refers to major developments reporting via DECs – while we support the application of DECs, and have done so for years, as a way to visibly display information, raise awareness and encourage improvements, we recommend that when reporting to the Mayor, developments should submit actual energy consumption and carbon emissions figures, not only the DECs which are subject to in-built methodology assumptions.

__§ 9.2.10-h:__ We recommend that the supporting text be more strongly worded, to ensure a firm commitment and details from applicants on energy and carbon emissions monitoring plans; should it be too early to confirm details at the planning application stage, there should be firm plans submitted to the Local Authority at a later stage, and in any case before practical completion.

Specific comments on the online portal:

- *There is a consensus among our members that the online portal will have to be comprehensive and versatile enough to account for different types of buildings and levels of occupancy. CIBSE would be happy to discuss this with the Mayor's team, given our experience on working with large building energy data sets and producing **energy benchmarks**.*
- *The design of the portal and data collection system should encourage long-term carbon reduction and energy saving rather than discourage participation if initial data readings are unsatisfactory.*

- *Appropriate regulations are needed to protect energy data from being exploited by energy companies or other stakeholders to raise energy prices.*
- *The supporting planning guidance (mentioned in 9.2.10) should provide clear and detailed guidance on the criteria for what and how energy data is collected, defining the time frame between readings, and the regulations for it.*

SI2-B Energy strategies and §9.2.10 – Carbon factors

*In addition to using **carbon factors** that are more representative of the current situation (as highlighted above), energy and carbon strategies should be evaluated against likely future carbon factors, to ensure they are as robust as possible and likely to deliver the best long-term outcomes.*

§9.2.10 – Demand management

*We **support the attention to demand management** to respond to future capacity challenges and facilitate the decarbonisation of the grid. We would, as we have stated in other places, encourage a **technology-agnostic** approach: the focus should be on reducing peak demand and managing demand – how this is done is for the team to demonstrate. We would therefore recommend the text be amended to allow more diversity and innovation in solutions e.g. changing from "proposals for demand-side response, specifically through installation of smart meters..." to be changed to "measures to reduce peak demand and promote demand management, for example, but not limited, localized battery storage systems or installation of smart meters ..."*

§9.2.10 – Energy costs

We welcome the encouragement for energy strategies to include an analysis of the expected costs to occupants. This should be an essential factor in decision-making, particularly in housing schemes in order to reduce the risk of fuel poverty.

Link with air quality (policy SI1)

See our response to SI1 on the need to account for filtration measures in energy calculations – applicants need to provide consistent responses to both air quality and carbon emissions requirements.

84. SI3 Energy infrastructure

A - Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy requirements and infrastructure arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.
B - Energy masterplans should be developed for large-scale development locations which establish the most effective energy supply options. Energy masterplans should identify:
1) major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
2) heat loads from existing buildings that can be connected to future phases of a heat network
3) major heat supply plant
4) possible opportunities to utilise energy from waste
5) secondary heat sources
6) opportunities for low temperature heat networks
7) possible land for energy centres and/or energy storage
8) possible heating and cooling network routes
9) opportunities for future proofing utility infrastructure networks to minimise the impact from road works
10) infrastructure and land requirements for electricity and gas supplies
11) implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector.
C - Development Plans should:
1) identify the need for, and suitable sites for, any necessary energy infrastructure requirements including upgrades to existing infrastructure

2) identify existing heating and cooling networks and opportunities for expanding existing networks and establishing new networks.

D - Major development proposals within Heat Network Priority Areas should have a communal heating system

1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

a) connect to local existing or planned heat networks

b) use available local secondary heat sources (in conjunction with heat pump, if required, and a lower temperature heating system)

c) generate clean heat and/or power from zero-emission sources

d) use fuel cells (if using natural gas in areas where legal air quality limits are exceeded all development proposals must provide evidence to show that any emissions related to energy generation will be equivalent or lower than those of an ultra-low NOx gas boiler)

e) use low emission combined heat and power (CHP) (in areas where legal air quality limits are exceeded all development proposals must provide evidence to show that any emissions related to energy generation will be equivalent or lower than those of an ultra-low NOx gas boiler)

f) use ultra-low NOx gas boilers.

2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that there is no significant impact on local air quality.

3) Where a heat network is planned but not yet in existence the development should be designed for connection at a later date.

CIBSE response

We support the adoption of strategic approaches at the GLA and Borough level.

We broadly support the heat hierarchy, but would stress the following:

- *Low-temperature systems are crucial in maximising future flexibility to adopt a range of low-carbon sources. While there is already guidance from the Mayor on this, it is not necessarily always followed.*

- *We welcome the references to the CIBSE Code of Practice for guidance on design and operation, and to the Heat Trust Standard for consideration of consumer protection and affordability.*

- *In order not to jeopardise the Mayor's plan for air quality and for a zero carbon city by 2050, networks should minimise the risk of "tying in" developments to fossil fuel generation. District energy schemes should therefore produce **plans for long-term transition to zero-carbon and zero-air-pollution emissions**, well before 2050 (as there will also be emissions from the existing stock to deal with in order to achieve a full "zero carbon city" by 2050); a possible target date of 2030 has been suggested by members and by the LETI initiative; we would broadly support this and add that if applicants submit proposals for later dates than 2030, this should be justified and no later than the 1st replacement of their plant (e.g. if an applicant expected completion of the network by 2022, with an assumed plant life of 15 years, the network should have plans for zero-carbon and zero-air-pollution to be achieved by no later than 2037).*

- *While we recognize the potential for **fuel cells** to offer low carbon and low polluting emissions, the technology is still at early stages of application. As noted elsewhere in our response, we believe that **policy should be outcome based and technology neutral**: policy should focus on the desired outcomes (including carbon reduction, low air polluting emissions, flexibility and future-proofing), without being overly specific on the technologies to adopt. These should be best identified by project teams, for the specificities of their project, taking account of the latest technology developments. We do not think fuel cells warrant in themselves a place in the energy hierarchy, differentiated from other low-carbon and low-emissions technologies – for example, they could be amongst the range of options listed under point (c).*

- *As highlighted in our response to policy SI2, the evaluation of carbon savings offered by individual technologies is reliant on **carbon factors for natural gas and grid electricity**. The one currently used in Part L for grid electricity is not representative of the actual situation, and the gap is expected to widen in the future. This significantly modifies the assessment of carbon savings by technologies such as CHP and heat pumps, and should be taken into account in energy and carbon strategies. In addition to using carbon factors that are more representative of the current situation, energy and carbon strategies should be evaluated against likely future carbon factors, to ensure they are as robust as possible and likely to deliver the best long-term outcomes.*

*SI3 should include a similar policy than SI2, i.e. there should be a requirement to **monitor and report on the performance of district energy schemes,** separately from the individual buildings being served. This would help monitor implementation, inform future policy, and distinguish between the responsibilities of different parties.*

SI3 – B - 4 and §9.3.7 - Energy from waste

We agree that waste-to-heat schemes may be an appropriate option in some cases, in some locations and for some types of waste streams. However, this should only be after other waste management options following the circular economy principles have been explored. While using heat from existing plants may be appropriate, new waste-to-heat plants should only be proposed with much caution; not only could they jeopardise the objective of policy SI1 of Improving Air Quality, they would also contradict the objective of SI7 of Supporting the Circular Economy, and create a financial dis-incentive for local authorities and private waste management companies to improve recycling rates.

In any case, we do <u>not</u> agree that heat from waste should be classified as a renewable energy, as is currently stated in §9.3.7. Waste-to-heat plants should we treated in a similar way to boilers and CHP plant, with scrutiny over their air quality impact.

SI3-D Heating hierarchy

Implementing or connecting to heat networks should be linked to carbon savings, not as an end in itself.

- *In some cases, for example where loads have been reduced substantially through passive design, energy efficiency, and demand management, the implementation of a heat network would not offer carbon savings. Policy should accommodate and encourage this, provided it is robustly demonstrated by applicants.*
- *We would recommend swapping 1a) and 1b) in the hierarchy, i.e. giving local heat sources priority over networks, especially if those are planned rather than existing networks. Local heat sources should also include energy sharing loops.*
- *In the case of **connecting to existing networks,** the network should be demonstrated to operate efficiently, offer carbon savings, have a zero-carbon and zero-emissions transition plan, and be of reasonable running costs to occupiers. Should the existing network not operate efficiently, connection to the new development should only be considered if it is demonstrated that measures are being taken to rectify it and offer carbon savings to the new development, or if connecting the development would allow it to operate more efficiently and offer carbon savings to the new development e.g. if the new development provides a heat load that helps balance the network's operation.*
- *Networks should wherever possible be constructed in accordance with the industry standard practice described in CIBSE CP1, Code of Practice for district heating networks. This is essential to avoid long term lock in to sub-standard underperforming networks which can have a lifetime well in excess of 50 years.*

85. SI4 Managing heat risk

A - Development proposals should minimise internal heat gain and the impacts of the urban heat island through design, layout, orientation and materials.
B - Major development proposals should demonstrate through an energy strategy how they will reduce the potential for overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:
    1) minimise internal heat generation through energy efficient design
    2) reduce the amount of heat entering a building through orientation, shading, albedo, fenestration, insulation and the provision of green roofs and walls
    3) manage the heat within the building through exposed internal thermal mass and high ceilings
    4) provide passive ventilation
    5) provide mechanical ventilation
    6) provide active cooling systems.

CIBSE response

We agree with the objectives of this policy to deliver low-carbon buildings that also support the health and comfort of occupants, and welcome the cross-reference between this policy and SI2. We would emphasise that this policy is inextricably linked with the discussion of form and that Policy D1 on Form and Characteristics should explicitly address the importance of considering overheating at the earliest stages when form and massing of developments are being considered.

*We would also highlight the potential of **green infrastructure** to contribute to limiting heat risk, now and in the future. This is only covered in the supporting information with a brief mention of green roofs (§9.4.2), which risks missing significant opportunities – see our comments to policy GG6 on resilience and adaptation, and to Chapter 8.*

We broadly support the cooling hierarchy although, as a small point of principle, we would put passive design first, before energy efficiency and internal heat gain generation (i.e. we would swap the order of B-1 and B-2).

*Overheating risk is a particular concern in **residential development** and we think this should be reflected in the policy. There should be a requirement that comfortable conditions, as demonstrated for example by CIBSE TM59 assessments, can be met without mechanical cooling. This is essential for comfort and health, limiting running costs and the risk of fuel poverty, resilience, and limiting energy consumption and carbon emissions.*

*It is worth recognising that there are a number of common risk factors to poor indoor air quality and overheating problems. When a development is considered at high-risk (e.g. on a noisy site, or with vulnerable populations), we would recommend **post occupancy evaluation** be conducted on sample areas (e.g. 10% of apartments in a residential development).*

We welcome the encouragement to overheating risk assessment, including dynamic modelling, and the reference to CIBSE TM52 and TM59 guidance.

*We note that in practice **noise** from external sources is often a significant constraint to ventilation and heat dissipation, and this policy is therefore strongly linked to policy D13 (it is also obviously linked to **air quality**, although there is much less evidence that external pollution affects people's likelihood to open windows for heat dissipation). Early design stage considerations are crucial. Careful site planning and building layout can bring significant benefits in reducing the risk of overheating as well as future exposure to noise and air pollution, for example by avoiding single-aspect apartments, not locating schools on high-traffic roads, and offering more flexible ventilation solutions. CIBSE are collaborating with the Association of Noise Consultants and Institute of Acoustics on this, and we can keep the Mayor of London informed of developments in our guidance. As also highlighted in our response to policy D13, we would recommend references to the Pro-PG[35] and to the current draft Acoustics, Ventilation and Overheating guidance[36] from the Association of Noise Consultants.*

86. SI5 Water infrastructure

A - In order to minimise the use of mains water, water supplies and resources should be protected and conserved in a sustainable manner.
B - Development Plans should promote improvements to water supply infrastructure to ensure security of supply. This should be done in a timely, efficient and sustainable manner taking energy consumption into account.
C - Development proposals should:
   1) minimise the use of mains water in line with the Optional Requirement of the Building Regulations (residential development), achieving mains water consumption of 105 litres or less per head per day (excluding allowance of up to five litres for external water consumption)
   2) achieve at least the BREEAM excellent standard (commercial development)
   3) be encouraged to incorporate measures such as smart metering, water saving and recycling measures, including retrofitting, to help to achieve lower water consumption rates and to maximise future- proofing.
D - In terms of water quality Development Plans should:

[35] *ProPG: Planning & Noise – New Residential Development*, May 2017 http://www.ioa.org.uk/publications/propg
[36] http://www.association-of-noise-consultants.co.uk/wp-content/uploads/2018/02/AVO-Guide-draft-for-consultation.pdf?dm_i=142S,5GMGN,RK885D,L5RSU,1, February 2018

1) promote the protection and improvement of the water environment in line with the Thames River Basin Management Plan, and should take account of Catchment Plans

2) support strategic wastewater treatment infrastructure investment to accommodate London's growth and climate change impacts. Such infrastructure should be constructed in a timely and sustainable manner taking account of new, smart technologies, intensification opportunities on existing sites, and energy implications. Boroughs should work with Thames Water in relation to local wastewater infrastructure requirements.

E - Development proposals should:

1) seek to improve the water environment and ensure that adequate wastewater infrastructure capacity is provided

2) be designed to ensure that misconnections between foul and surface water networks are eliminated and not easily created through future building alterations.

CIBSE response

SI5-A, B, and E: *We support the overall objectives but would welcome the introduction of clearer and more specific criteria, and more specific targets for improvements to the water environment.*

SI5-C: *We support the water efficiency objectives of the policy, and the new attention given to non-domestic buildings. Smart metering could help monitor building performance, in a similar way as we support the monitoring of energy performance (SI2 & SI3).*

We would also recommend the use of a holistic approach with recognition of the potential contribution by **green infrastructure to water management and water quality** *– see response to Chapter 8.*

87. SI6 Digital connectivity infrastructure

A - To ensure London's global competitiveness now and in the future, development proposals should:

1) achieve greater digital connectivity than set out in part R1 of the Building Regulations

2) ensure that sufficient ducting space for future digital connectivity infrastructure is provided

3) meet requirements for mobile connectivity within the development and take appropriate mitigation measures to avoid reducing mobile connectivity in surrounding areas

4) support the effective use of the public realm (such as street furniture and bins) to accommodate well-designed and located mobile digital infrastructure.

CIBSE response

We broadly welcome the objectives, however we think it would be useful to include clarifications and more specific objectives, in particular what is meant by "greater" digital connectivity than in Part R1 of the Building Regulations.

88. SI7 Reducing waste and supporting the circular economy

A - Waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved by:

1) promoting a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible

2) encouraging waste minimisation and waste avoidance through the reuse of materials and using fewer resources in the production and distribution of products

3) ensuring that there is zero biodegradable or recyclable waste to landfill by 2026

4) meeting or exceeding the recycling targets for each of the following waste streams and generating low-carbon energy in London from suitable remaining waste:

   a) municipal waste127 – 65 per cent by 2030

   b) construction, demolition and excavation waste – 95 per cent by 2020

5) designing developments with adequate and easily accessible storage space that supports the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food.

B - Referable applications should promote circular economy outcomes and aim to be net zero-waste. A Circular Economy Statement should be submitted, to demonstrate:

1) how all materials arising from demolition and remediation works will be re-used and/or recycled

2) how the proposal's design and construction will enable building materials, components and products to be disassembled and re-used at the end of their useful life

3) opportunities for managing as much waste as possible on site
4) adequate and easily accessible storage space to support recycling and re-use
5) how much waste the proposal is expected to generate, and how and where the waste will be handled.

CIBSE response

*We support the promotion of the circular economy and attention to waste reduction. We think the policy should be strengthened so that the **production of "waste" should be justified**, with robust interrogation of how **waste has been minimised** and, once produced, how it could be used as a **resource** instead.*

In the construction sector, reducing waste and supporting the circular economy would also contribute to the objectives of policy SI2 to reduce embodied carbon, as well as other resources conservation benefits.

*We welcome the policies targeting reduction of construction waste, and the ambitious recycling targets by 2020. We would note however that recycling is a "late" step in the resources strategy; emphasis should be placed on driving the efficient use of materials in the first place. Guidance and benchmarks on this topic could be gathered from other sources (e.g. BRE, WRAP). For consistency and impact, this policy should also lead to **interrogating demolition proposals**, so that **opportunities for adaptive re-use and refurbishment** are maximised, with thorough justification for demolition if that is the chosen proposal. This would also link to policy SI2 on embodied carbon – see more details in our response to that policy.*

The wording of policy SI7-B is currently ambiguous in places about whether it addresses construction or operational waste, or both. It is assumed that points 1) and 2) refer to construction, and points 3), 4) and 5) to operation. It would be useful for the final wording to be clearer.

We note the Mayor intends to produce more guidance on Circular Economy Statements. This would be welcome, with best practice examples.

89. SI8 Waste capacity and net waste self-sufficiency
90. SI9 Safeguarded waste sites
91. SI10 Aggregates
92. SI11 Hydraulic fracturing (Fracking)

A - Development proposals for exploration, appraisal or production of shale gas via hydraulic fracturing should be refused.

CIBSE response

CIBSE support Research & Development efforts and investment in reducing energy consumption in the first place, rather than investing in expensive and complex solutions such as fracking, particularly in the London area, which prolong the fossil fuel economy and carry substantial environmental risk including water consumption and pollution.

93. SI12 Flood risk management

A - Current and expected flood risk from all sources across London should be managed in a sustainable and cost effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.
B - Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Surface Water Management Plan, where necessary, to identify areas where particular flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should co-operate and jointly address cross-boundary flood risk issues including with authorities outside London.
C - Development proposals which require specific flood risk assessments should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.
D - Developments Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.

E - Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.

F - Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Where possible, development proposals should set permanent built development back from flood defences to allow for any foreseeable future upgrades.

CIBSE response

*We support the overall objectives but would welcome the introduction of **clearer and more specific criteria**.*

*We would also recommend the use of a holistic approach with recognition of the potential contribution by **green infrastructure** – see response to Chapter 8.*

94. SI13 Sustainable drainage

A - Lead Local Flood Authorities should identify – through their Local Flood Risk Management Strategies and Surface Water Management Plans – areas where there are particular surface water management issues and aim to reduce these risks.

B - Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

1) rainwater harvesting (including a combination of green and blue roofs)
2) infiltration techniques and green roofs
3) rainwater attenuation in open water features for gradual release
4) rainwater discharge direct to a watercourse (unless not appropriate)
5) rainwater attenuation above ground (including blue roofs)
6) rainwaterattenuationbelowground136
7) rainwater discharge to a surface water sewer or drain
8) rainwater discharge to a combined sewer.

C - Development proposals for impermeable paving should be refused where appropriate, including on small surfaces such as front gardens and driveways.

D - Drainage should be designed and implemented in ways that address issues of water use efficiency, river water quality, biodiversity, amenity and recreation.

CIBSE response

*We support the overall objectives but would welcome the introduction of **clearer and more specific criteria**.*

Sustainable management of surface water should be applied everywhere, not just in areas where it is already an issue.

*We would also recommend the use of a holistic approach with recognition of the potential contribution by **green infrastructure** – see response to Chapter 8.*

SI13-D: *We support the attention to small measures such as the hard surfacing of front gardens and driveways, as they can incrementally have a large effect.*

Chapter 10 – Transport

Transport policy is not CIBSE's core area of expertise, therefore we have not provided detailed comments to this section. We would however emphasise the importance of effective policies to promote walking and cycling, including good planning of the built environment, in order to deliver essential policy objectives such as noise, air quality, carbon emissions, and health.

*We would make the following comments on **electric vehicles** as their introduction can have direct implications on infrastructure resilience, the built environment, and the country's long-term ability to deliver low-carbon heat and low-carbon electricity:*

- *As highlighted in our response to Policy D7, we would welcome a review of the potential for the shared economy to **free space currently allocated to individual car-parking spaces**, with space becoming available in the future for other uses such as play areas, green space etc. This could include ensuring that new developments have a strategy in place for future reductions in individual car-parking spaces, and studies in existing areas e.g. housing estates, residential streets, retail parks. This also links to our comment on the reference to cycle storage under D4. CIBSE would be happy to collaborate with the Mayor's team on this.*
- *In the shorter-term, we strongly recommend that **charging points should be "smart" to facilitate demand management.***

Chapter 11 - Funding the London Plan

113. DF1 Delivery of the Plan and Planning Obligations

A - Applicants should take account of Development Plan policies when developing proposals and acquiring land. It is expected that viability testing should normally only be undertaken on a site-specific basis where there are clear circumstances creating barriers to delivery.

B - If an applicant wishes to make the case that viability should be considered on a site-specific basis, they should provide clear evidence of the specific issues that would prevent delivery, in line with relevant Development Plan policy, prior to submission of an application.

C- Where it is accepted that viability of a specific site should be considered as part of an application, the borough should determine the weight to be given to a viability assessment alongside other material considerations. Viability assessments should be tested rigorously and undertaken in line with the Mayor's Affordable Housing and Viability SPG.

D - When setting policies seeking planning obligations in local Development Plan Documents and in situations where it has been demonstrated that planning obligations cannot viably be supported by a specific development, applicants and decision-makers should firstly apply priority to affordable housing and necessary public transport improvements, and following this:

1) Recognise the role large sites can play in delivering necessary health and education infrastructure; and
2) Recognise the importance of affordable workspace and culture and leisure facilities in delivering good growth.

E - Boroughs are also encouraged to take account of part D in developing their Community Infrastructure Levy Charging Schedule and Regulation 123 list.

CIBSE response

This is not a core area of expertise of CIBSE and we cannot therefore comment in detail. We are however aware of the following feedback on viability assessments: a lack of transparency and clarity on the methodology makes their review by planning authorities difficult; and: the declared land value, or the price at which land was purchased, may not take full account of all planning policies (especially those on affordable housing provision), resulting in higher declared land prices, these prices then being used in viability assessments as

*evidence that policies cannot "viably" be met[37]. We would therefore support the intent of policy DF1-A which requires **London Plan policies to be taken into account when acquiring land,** as this could help towards achieving higher standards without necessarily resulting in increased overall costs, in particular housing costs.*

*This would also be helped if there were **strong signals that essential policies will consistency be applied,** with **essential parts of the policies worded unambiguously wherever possible** (e.g. using wording such as applicants "should" or "must" rather than "are encouraged to") and therefore need to be incorporated into land values and development proposals[38].*

Chapter 12 - Monitoring

114. Policy M1 Monitoring

A The implementation of the London Plan will be kept under review using, in particular, the Key Performance Indicators set out in Table 12.1 and reported in the Annual Monitoring Report.

CIBSE response

*We support the inclusion of KPIs to measure the implementation of all policies; we however note that the only 2 KPIs on environmental progress are Green Belt and Metropolitan Land, and Carbon Emissions. **This seems very limited, given the ambitions of the Plan. We would also strongly recommend that there is a specific team within City Hall to measure the impacts and benefits of the London Plan.***

The information gathered on the delivery of the Plan's objectives could be linked to a wider programme of data gathering and analysis, with information made publically available as much as possible, to analyse how the city is functioning and help develop future policies in terms of the environment, transport, land uses etc, both strategically and at local government level. Examples may be found from other cities around world.

We would make the following recommendations:

- *Additional KPIs related to **Green Infrastructure** policies; in particular, there should be monitoring in place on the progress towards the Mayor's manifesto commitment for "**London at least 50 percent green by 2050**" (policy G1), and the Mayor's **intent to increase tree cover by 10% by 2050** (policy G7). Monitoring of development- and borough-wide UGF should also be carried out, to help assess the effectiveness of the UGF approach. We would also welcome the inclusion of a **biodiversity** indicator.*

- ***Carbon**: the proposed KPI relates to improvements against Building Regulations 2013, for approved applications. Please refer to our response on policy SI2 regarding the shortcomings of using Part L as indicator of actual carbon emissions. We would also note there are significant discrepancies not only between actual emissions and Part L emissions, but also between Part L assessments at planning stage, as seems to be implied by this KPI, and as-built Part L assessments. We would strongly encourage a modification of this indicator if progress in real carbon emissions savings is to be monitored: alongside design- and as-built stage Part L improvements, **operational carbon** should be monitored, with the view to facilitate the transition to operational carbon objectives in the future. As noted in our response to policies SI2 and SI3, we would also strongly recommend to monitor the performance of **district energy schemes**, including carbon emissions, plant energy efficiency, and running costs (to limit risks of fuel poverty).*

- ***Air quality**: the measure should be more specific and refer to progress towards objectives (i.e. WHO guidelines, as recommended in our response to policy SI1 and as suggested in the draft Environment Strategy), rather than simply to the "trend". Major emitters should report emissions on their plant, and the Mayor's team should monitor progress towards "zero-carbon, zero-emissions" district energy schemes (policy SI3).*

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[37] See for example The Guardian investigations on viability assessments, including the use of "market value": Wainwright, O., *Revealed: how developers exploit flawed planning system to minimise affordable housing,* June 2015

[38] This feedback was consistently provided, for example, at the New London Architecture's event on the London Plan, "the Big Debate", held on 5th February 2018 https://www.youtube.com/watch?v=f2ex6_cgeYc

*We would also recommend that the GLA consider the move towards measuring end-goal **outcomes** – for example, in the case of measures such as air quality which are targeted at health improvements, it would be useful to be able to assess in the longer-term the impact of air quality policies on associated health indicators.*

END

Response collated and submitted by:

Dr Julie Godefroy
CIBSE, Head of Sustainability Development
JGodefroy@cibse.org

Please do not hesitate to contact us for more information on these responses.