MAYOR OF LONDONLONDONASSEMBLY

‘Be seen’ energy monitoring guidance

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1. Introduction

1.1 What is this guidance?

This guidance explains the process that needs to be followed to comply with the ‘be seen’ post-construction monitoring requirement of Policy SI 2 of the Intend to Publish London Plan (London Plan). It is for anyone involved in the planning, design, construction, delivery and operation of new major development including planning applicants, energy consultants, designers, developers, contractors, building owners, network operators, facilities managers and local government officials.

The policy applies to major development proposals and the necessary reporting requirements should be secured by condition or legal agreement as part of planning approval.

The guidance sets out what each responsible party needs to do to comply with the policy from the inception stage of a development to full occupancy. Planning applicants will need to ensure that each responsible party is aware of their design and reporting responsibilities at each reporting stage.

It also provides information on the ‘be seen’ monitoring portal and breaks up the process into three main reporting stages on which information needs to be submitted (i.e. planning stage, as-built stage and in-use stage).

The collected data will help the GLA and local authorities better understand how London Plan policies are being applied to new developments, it will provide useful insights to the performance gap and will drive improved building performance.

1.2 What is ‘be seen’ energy monitoring?

To truly achieve net zero-carbon buildings we need to have a better understanding of their actual operational energy performance. Although Part L calculations and Energy Performance Certificates (EPCs) give an indication of the theoretical performance of buildings, it is well established that there is a ‘performance gap’ between design theory and measured reality.

To address this gap the London Plan Policy SI 2 ‘Minimising greenhouse gas emissions’ introduces a fourth stage to the energy hierarchy; the ‘be seen’ stage, which requires monitoring and reporting of the actual operational energy performance of major developments for at least five years via the Mayor’s ‘be seen’ monitoring portal.

The ‘be seen’ policy establishes post-construction monitoring as good practice, enabling developers and building owners to better understand their buildings and identify methods for improving energy performance from the project inception stage and throughout the building’s lifetime.

2. Background and related information

2.1 Policy background and objectives

The Mayor of London has declared a climate emergency and has set an ambition for London to be net zero-carbon. This means all new buildings must be net zero-carbon. The Mayor’s London Plan sets the targets and policies required to achieve this.

There is growing concern that buildings currently could be using as much as two to ten times the amount of energy they were originally estimated to1. Numerous studies such as the Committee on Climate Change’s (CCC) UK Housing: Fit for the Future have highlighted the importance of closing the performance gap and making actual energy performance data available2.

Requiring buildings to be designed to high specification standards and mandating transparency about energy performance is critical to diminishing the performance gap. Measuring and understanding the performance gap will help identify ways of closing it.

Ensuring that the actual energy and carbon performance of buildings is aligned with the estimated energy and carbon performance will also be a key factor in achieving a zero-carbon London. The ‘be seen’ policy will help verify the London Plan policies and ensure compliance with London’s net zero-carbon standard.

The energy performance data that will be reported could also provide an evidence base which can be used to inform future benchmarks, metrics and policies, based on in-use performance.

Post-construction monitoring is vital in achieving net zero-carbon buildings and an effectively implemented post-construction monitoring regime can have a number of benefits including environmental (e.g. reduced grid infrastructure strain, carbon emissions reduction) and socio-economic (e.g. reduced occupants’ bills, raised awareness around energy usage).

3. ‘Be seen’ framework

3.1 About this section

This section explains the framework underpinning the ‘be seen’ policy. It provides an outline of the process and responsibilities, details of the performance indicators that planning applicants, developers and/or building

owners will need to report on, information on the ‘be seen’ portal which will be used to report this information and explains how each element of a development (i.e. the reportable units) should be reported on.

3.2 Process and responsibilities

Illustration 1 outlines the ‘be seen’ process through the reporting stages of a development including the parties likely to be responsible for the provision of the necessary data at each reporting stage (see right hand side of the figure). Sections 4-6 and FAQ question 1 set out the ‘be seen’ process and responsibilities in more detail.

Illustration 1: *‘Be seen’ process and responsibilities*

Applicants and developers should adopt third-party verification mechanisms to ensure accuracy in their submissions.

3.3 Performance indicators

The performance indicators fall into five groups which are described in Table 1. The specific indicators that should be reported at each stage of the monitoring process (i.e. from planning to as-built to in-use) are described in the subsequent sections and tailored according to whether the development is residential or non-residential.

Table 3.1 : Table 1: ‘Be seen’ performance indicator groups

Performance indicator group	Description
Contextual data	Applicants will be expected to provide contextual data relating to the development’s reportable units (RUs) (see section 3.4). This includes non-energy information such as data on location and typology of buildings.
Building energy use	Applicants will be expected to report on the energy and fuel imports into each RU of a development. This includes data from national energy grids (e.g. electricity, gas etc.) and district heating connections. This information will enable the building owner to report on the amount of energy being consumed on-site for distinct building uses.
Renewable energy	Applicants will be expected to report on the renewable energy generation within the development to identify how much energy is being generated on-site and where this is used.

Performance indicator group	Description
Energy storage equipment	Applicants will be expected to report on building energy storage equipment data.
Plant parameters	Applicants will be expected to report on parameters that relate to the performance of heat or cooling generation plant within energy centres that form part of a development. This will include energy inputs and outputs of energy centres, energy use and contribution of heating and cooling technologies, and network efficiency data to monitor losses in district and communal energy networks.
Carbon emissions	Applicants will be expected to report on the development's estimated carbon emissions at planning stage based on the appropriate carbon emission factors, as set out in the GLA's Energy Assessment Guidance. When on-site carbon reductions have been maximised, but a carbon shortfall still exists, applicants will be expected to report on and confirm the carbon offsetting contribution to the relevant local authority's fund in line with the net zero carbon target.

Appendix 1 provides a high-level summary of all the reporting requirements for all three 'be seen' stages.

3.4 Reporting to the GLA

Applicants will need to report against the performance indicators at each stage of the process by downloading the 'be seen' reporting spreadsheet from the 'be seen' webpage[3] of the GLA's website. Once the information has been completed the spreadsheet should be emailed back to: ZeroCarbonPlanning@london.gov.uk. The same spreadsheet will be used for all stages of the process featuring separate tabs for each reporting stage (i.e. planning stage, as-built stage, in-use stage).

The 'be seen' portal will be hosted on the London Building Stock Model (LBSM) website and will contain a summary of the building's estimated and actual performance. Once it is available, the 'be seen' webpage and this guidance document will be updated to explain how to report via the portal.

3.5 Reportable units (RUs)

Developments can be made up of a mix of uses, phases and tenures which must be disaggregated to allow comprehensive reporting. For the purposes of complying with the 'be seen' policy, a development is split into a number of 'reportable units' (RUs) which applicants will need to report against individually:

- The energy centre(s) RUs.
- The residential RUs, which aggregate individual dwelling units to secure data privacy.
- The non-residential RUs.

Illustration 2: *Visual representation of a development's reportable units*

Notes on Illustration 2 and how reportable units work:

Energy centre(s) reportable units

An energy centre RU is one of the following:

- A connection to an existing third-party district heating or cooling network.
- Each self-contained energy centre falling within the scope of the development's planning application, serving multiple non-residential or domestic properties with heating, cooling or electricity via a distribution network.
- Each heating and/or cooling energy system serving multiple residential properties e.g. a communal heating system in a block of flats.

Residential reportable units

Each residential RU within a major development should be reported against separately. A residential RU qualifies as:

- An individual block of five or more flats.
- A group of five or more houses all planned to be completed within a three-year period[4].

Five dwellings is the threshold above which anonymity of energy data is accepted and is therefore adopted as the minimum size of an RU. This is in line with the Statistics of Trade Act 1947[5] according to which the aggregation of five or more returns would ensure the information could not be tracked back to any one individual return.

Where dwellings form part of a mainly non-residential building, they should be separated out from the non-residential RU and treated as a separate residential RU. If the total number is less than five dwellings, they should be added to other residential units in the development, if applicable, or considered de minimis (see below). For cases where there may be less than five apartments above a non-residential development then this would become de minimis.

Note that common areas of a block of flats are treated as a single occupier/tenant non-residential RU, in a similar manner to how they are treated under Part L of the building regulations[6].

Non-residential reportable units

A non-residential RU is an individual building/facility which should be reported against separately and which will fall into one of the following two categories:

- A building (of any use type) with a single occupier/tenant.

- A building (of any use type) with multiple tenants. The RU is each tenant's premises.

Each non-residential RU should be determined so that a Display Energy Certificate (DEC) can be produced for it. This could be a discrete 'building' as defined by the Energy Performance of Buildings Regulations;[7] or it could be premises within a building that would often be separately let.

Appendix 2 provides examples of how some typical developments would be separated into RUs.

De minimis threshold

A de minimis threshold applies, where the gross internal floor area (GIA) of a RU is less than 250m2 and/or the expected emissions for the unit are less than 5% of the development's total emissions. De minimis buildings are only required to report energy generation from renewable energy technologies[8]. Note that the de minimis threshold applies to the total area of the same use type. For instance, a row of shops that in total is above 250m2 (but each individual unit is less than 250m2) and produces more than 5% emissions of the development's total emissions, would need to be reported separately for each RU.

4. Planning stage: process and requirements

4.1 Process of data submission

During the planning stage, the responsibility for data submission and ensuring accurate estimates as the design develops lies with the applicant. The applicant will be expected to ensure that all affected parties (e.g. developer, building owner, landlord or occupier) are aware of their responsibilities at subsequent reporting stages. This should be appropriately secured through conditions or a legal agreement (S106 agreement) between the local authority and the applicant. The responsibilities for reporting should be clearly set out in this.

For major applications where planning permission has been granted (RIBA Stage 2/3), the applicant is required to provide estimates of each of the performance indicators listed in Table 2. These should be reported to the GLA using the 'be seen' spreadsheet, which is downloadable from the 'be seen' webpage, within four weeks of planning approval. The applicant will also be required to provide the upcoming reporting stages' target dates for the submission of updated information against the performance indicators at the 'as-built' and 'in-use' stages. Target dates should be provided by the applicant within four weeks of planning approval.

4.2 Reporting requirements and process of data generation

Energy assessments, which are required to demonstrate compliance with wider aspects of Policy SI 2, will contain the majority of the necessary evidence requested at planning stage (i.e. building energy use data, carbon emissions and carbon offsetting estimates), as outlined in Table 2.

At this stage of reporting, estimates are provided for the entire development as a whole, not for individual RUs. Reporting against individual RUs takes place from the as-built stage onwards.

For residential uses, the methodology for reporting energy consumption (kWh/m2) and carbon emissions (tonnes CO2/m2) estimates should follow a Building Regulations Part L compliant methodology using the Standard Assessment Procedure (SAP) tool. This is as per current planning calculation and reporting methodologies.

For non-residential uses, energy consumption (kWh/m2) and carbon emissions (tonnes CO2/m2) estimates should be informed and reported using two separate methodologies. Applicants will firstly be required to submit the Building Regulations Part L compliant figures, in line with London's existing planning approach. These should be the same as the data included in the GLA's Energy Assessment Guidance.

Additionally, CIBSE TM54 analysis, which recommends using a tailored Part L model for the estimates of regulated and unregulated loads, should be undertaken and its findings should be reported in the 'be seen' spreadsheet. A TM54 analysis gives more accurate predictions of a building's energy use. This approach also aligns with the reporting requirements under the GLA's Whole Life-Cycle Carbon (WLC) Assessment Guidance. The CIBSE TM54 findings should therefore also be used to represent the regulated and unregulated energy requirements for non-residential uses of Module B6, in line with the WLC requirements.

Table 4.1 : **Table 2:** Planning stage performance indicators

Performance indicator group	Description
Contextual data	• Location Unique Property Reference Number (UPRN) or Address (if no UPRN available) • Site plan • Typology / Planning Use Class (all included) • GIA (m2) for each Typology / Use Class • Anticipated target dates for each 'be seen' reporting stage (i.e. 'as-built' and 'in-use' per Illustration 1)
Building energy use	• Grid electricity consumption (kWh) • Gas consumption (kWh) • Other fuels consumption (kWh) • District heating/cooling consumption(kWh) (if applicable)
Renewable energy	• Energy generation (kWh)
Carbon emissions	• Carbon emissions estimates (tonnes CO2/m2) for residential and non-residential uses separately as well as the whole development • Carbon shortfall for the entire development (tonnes CO2) • Estimated carbon offset amount (£)

5. As-built stage: process and requirements

5.1 Process of data submission

Once the as-built design has been completed (upon commencement of RIBA Stage 6) and prior to the building being handed over (if applicable), an update should be provided to the GLA of the estimated performance indicators submitted at planning stage. This will include a number of additional indicators and a greater level of detail compared to the planning stage, along with some additional contextual information. This allows any changes in the detailed building design to be taken into account and will ensure greater accuracy of the energy and carbon estimates being reported. Also, reporting from this point on will be for individual RUs.

The responsibility for submission of all data at this stage will formally sit with the legal owner. This information will normally be provided by the developer. Much of the information is likely to be generated by the developer's contractor responsible for the construction of each RU and/or their subcontractors or the developer's own consultants. All suppliers involved need to be made aware of the requirement to report on the as-built energy performance estimates.

Although the legal owner or developer may contract some or all aspects of this process to the relevant energy centre or building design teams, they still retain the responsibility for ensuring the data is provided to the GLA and uploaded to the 'be seen' spreadsheet.

The performance indicators which are to be reported against at the as-built stage for each RU are provided in the following sections.

5.2 Energy centre(s) performance indicators

Predictions of each of the indicators outlined in Table 3 are required for each energy centre included as part of the development. Any indicators not relevant to the site (e.g. if the development is not connecting, or is not initially connecting, to a third-party district heating network) can be excluded.

Table 5.1 : **Table 3:** As-built stage estimated performance indicators for energy centre(s) RUs

Performance indicator group	Description
Contextual data	• Confirmation that a verified metering plan is in place
Plant parameters **Energy centre inputs**	• Grid electricity consumption (kWh) • Gas consumption (kWh) • Other fuels consumption (kWh)

Performance indicator group	Description
Plant parameters **Efficiency & contribution of each heating/cooling generation plant**	• Delivered efficiency of each heating (and/or cooling) generation plant (%) • % of heat supplied from each individual heating (and/or cooling) generation plant
Plant parameters **Network efficiency data**	• Predicted losses from heat/cooling distribution pipework (between energy centre and consumer meters) (kWh)
Plant parameters **3rd party DHN networks**	• District heating/cooling energy import (kWh) • District heating/cooling exported (to outside development) (kWh)
Renewable energy	• Renewable electricity generation (gross) (kWh) • Solar thermal heat generation (kWh)
Energy storage equipment	• Battery storage capacity (kWh) • Net electricity flow to Electric Vehicles (EVs) (kWh)

Developers will be expected to provide the predicted energy performance data for the district heating system based on the best available calculations provided by the energy centre design team.

Phased uptake of customers will affect network performance and in larger schemes the uptake of customers may be spread over an extended period. In order to account for this, the predicted performance of the energy centre must be submitted from the point where 50% of the expected customer base (by energy consumption) is connected or within five years of the energy centre supplying its first consumer, whichever is sooner.

At this stage developers should confirm to the GLA, via the ‘be seen’ spreadsheet, that verified metering plans have been produced and that metering installation is complete and correctly calibrated to allow for the required measured data after occupation to be submitted.

5.3 Residential and non-residential performance indicators

For all residential and non-residential RUs, estimates of the performance indicators presented in Table 4 should be submitted separately for each RU. The indicators for plant performance, renewable energy generation and energy storage equipment relate to systems directly linked to that RU (i.e. houses supplied by individual heating systems, solar photovoltaic (PV) panels connected to individual dwellings, retail units supplied by individual heat pumps etc.) rather than systems linked to centralised arrangements (e.g. energy centres). These are covered

by section 5.2.

Table 5.2 : **Table 4:** As-built stage estimated performance indicators for residential and non-residential RUs

Performance indicator group	Description
Contextual data	• Updates of contextual data provided at planning stage, if necessary • GIA (m2) for each RU • Confirmation that a verified metering plan is in place
Building energy use	• Grid electricity consumption (kWh) • Gas consumption (kWh) • Other fuels consumption (kWh) • District heating/cooling consumption(kWh) (if applicable) • Predicted DEC grade and rating (for non-residential RUs only)
Renewable energy	• Renewable electricity generation (gross) (kWh) • Solar thermal heat generation (kWh)
Energy storage equipment	• Battery storage capacity (kWh) • Net electricity flow to EVs (kWh)
Plant parameters Energy exported	• District heating energy exported (kWh) • District cooling energy exported (kWh)
Carbon offsetting*	• Carbon shortfall for the entire development (tonnes CO2) • Confirmation of carbon offset amount (£)

*The carbon offsetting figures apply to the entire development rather than the individual RUs.

Carbon and cost related figures will be calculated by the GLA once the information for the as-built and in-use stages has been submitted. The resulting carbon emissions will be calculated using the carbon emission factors as presented in the GLA Energy Assessment Guidance, to enable a direct comparison. Cost estimates on occupants' energy bills will be based on energy cost data taken from the Quarterly Energy Prices publication9 (BEIS), which provides separate energy costs for domestic and non-residential customers.

Residential reportable units

When submitting data against the performance indicators in Table 4 for residential RUs, developers should note the following guidelines.

For each dwelling or identical dwelling type, developers should:

- Undertake predictions of regulated energy consumption and renewable energy generation for each dwelling using SAP software.
- Undertake predictions of unregulated energy consumption using the BREDEM (BRE Domestic Energy Model) 2012 methodology10.
- Determine capacity of battery storage, net electricity flow to EVs and district energy exported (if present) based on design team or manufacturer's estimates.
- Provide confirmation via the 'be seen' spreadsheet, that verified metering plans have been produced and that metering installation is complete and correctly calibrated to allow for the required measured data after occupation to be submitted, including utility meters, renewable generation and battery storage/EV technologies.
- Aggregate the results within each residential RU. For utility supplies this should be the sum of regulated and unregulated loads, accounting for any energy use displaced by renewable energy generation within the dwelling.
- If dwellings receive district heating or cooling, provide a schedule of the dwellings included in each residential RU to the district heating operator in preparation for the in-use reporting stage.

Non-residential reportable units

When submitting data against the performance indicators in Table 4 for non-residential RUs, developers should note the following guidelines. The majority of the information requested as part of the as-built 'be seen' requirements for non-residential RUs should be acquired from the xml output file generated by the software used to predict the DEC rating. The remaining information should be provided by the developer's contractor/technical consultants.

As such, developers should:

- Produce a draft whole building DEC11 certificate and submit the associated xml file. The predicted energy consumption should be undertaken using the CIBSE TM54 methodology. This method tailors a Part L calculation to reflect the expected occupancy and usage of the building and calculates unregulated loads, again based on expected use and occupancy of the building.
- Predict the DEC grade and rating using the CIBSE TM54 results. For a building/facility with multiple tenants the RU is each tenant's premises, this requirement can be met by assuming generic tenants for tenancies where leases to actual tenants have yet to be signed.
- Determine capacity of battery storage, net electricity flow to EVs and district energy exported (if present) based on the developer/contractor design team or manufacturer's estimates.
- Provide confirmation to the GLA, via the 'be seen' spreadsheet, that verified metering plans have been produced and that metering installation is complete and correctly calibrated to allow for the required measured data after occupation to be submitted.

Currently DEC certificates only apply to buildings occupied by a public authority. However, the government explains that private organisations may elect to follow the same approach on a voluntary basis12. The DEC route has been selected by the GLA as a consistent means to compliance for all non-residential RUs. The DEC xml data file and the output from the DEC generation process will allow the submission of data to the 'be seen' portal (once it is available) to be automated to minimise data entry effort and risk of human error. The generation of a DEC certificate can only be overseen by a qualified assessor, ensuring consistency of approach with the in-use data and with other development submissions.

The information that will be made available from the DEC xml file and that which should be collected by the developer/contractor is presented in Table 5.

Table 5.3 : **Table 5:** Data sources for non-residential performance indicators

			Sources of information	
Performance indicator group	Individual indicator	Unit	DEC xml	Developer / Contractor
Contextual data	Expected hours of use per annum (p.a.)	hrs p.a.	y	
	Floor area (GIA)	m2	y	
Building energy use	Grid electricity consumption (input)	kWh	y	
	Gas consumption (Input)	kWh	y	
	Other fuel consumption (input)	kWh	y	
	District heating consumption	kWh	y	
	District cooling consumption	kWh	y	
	Predicted DEC grade and rating	A to G; rating	y	
Renewable energy*	Renewable electricity generation (gross)	kWh	y	
	Solar thermal heat generation	kWh	y	
Energy storage equipment	Battery storage capacity	kWh		y
	Net electricity flow to EVs	kWh		y

			Sources of information	
Performance indicator group	Individual indicator	Unit	DEC xml	Developer / Contractor
Plant parameters (energy exported)^	Total district heating exported	kWh		y
	Total district cooling exported	kWh		y

*For a building/facility with multiple tenants where offices are not the predominant use type and the RU is each tenant's premises: renewable energy data should be reported for the whole facility

^ Only required where the RU exports heat or cooling into a wider heat/cooling network. This is not captured by the DEC xml file and must be stated separately.

6. In-use stage: process and requirements

6.1 Process of data submission

During the in-use stage (RIBA Stage 7), responsibility for monitoring and reporting actual performance rests with the building owner. Where a building is handed over by the developer to the owner prior to occupation, the developer has the obligation to transfer information about the 'be seen' responsibilities. This includes how the development is broken down into RUs, the steps followed to date to achieve compliance with the policy and a link to this guidance document so that they understand which indicators must be reported in the upcoming years.

The building owner is required to monitor and report annual energy performance data for each qualifying RU via the 'be seen' spreadsheet for at least five years once the defects liability period (DLP) is complete. A DLP is usually estimated to be between 6 and 12 months and rarely lasts longer than 15 months.

Building owners who are no longer involved with the building during the five-year reporting period are responsible for passing on their monitoring and reporting responsibilities to the new building owner.

The performance data will give developers and building owners a better understanding of how each RU operates. If the in-use evidence submitted shows that the as-built performance estimates have not been or are not being met, the owner should investigate the matter, identify the causes of underperformance and the potential mitigation measures, as necessary, and set these out in the relevant comment box of the 'be seen' spreadsheet.

The performance indicators which are to be reported against at the in-use stage, annually and for a five-year period, are provided in the following sections for each RU.

6.2 Energy centre(s) performance indicators

The in-use performance indicators which should be reported for the energy centre(s) RUs are presented in Table 6. These align with the indicators required at the as-built stage with the exception that some of the data is reported through two data points (e.g. the energy exiting the energy centre, and the energy billed to consumers). This allows the system indicators to be calculated based on primary data.

Table 6.1 : **Table 6:** *In-use stage performance indicators for energy centre(s) RUs*

Performance indicator group	Description
Plant parameters **Energy centre inputs**	• Grid electricity consumption (kWh) • Gas consumption (kWh) • Other fuels consumption (kWh)
Plant parameters **Efficiency & contribution of each heating/cooling generation plant**	• Energy input to each heating/cooling energy conversion plant (kWh for each energy carrier) • Energy output from each heating/cooling energy conversion plant (kWh for each energy carrier)
Plant parameters **Network efficiency data**	• Total district heating (and/or cooling) output from production centre • Total district heating/ cooling supplied to customers (kWh)
Plant parameters **3rd party DHN connections**	• District heating/cooling energy import (kWh) • District heating/cooling exported (to outside development) (kWh)
Renewable energy	• Renewable electricity generation (gross) (kWh) • Solar thermal heat generation (kWh) • Renewable electricity exported (kWh) • Renewable electricity used on site (kWh)
Energy storage equipment	• Battery storage capacity (kWh) • Net electricity flow to EVs (kWh)

Developers should collect the energy performance indicators in Table 6, using direct metering of the energy centre and consumers. It is likely that the responsibility for reporting this data annually will be transferred to the operator of the site-wide or third-party district heating system at this stage. The operator should ensure data protection is in line with national regulations. When the developer and/or building owner contracts with a party

to operate the network for their development or with a third-party district heating system to provide heating and cooling to their development, these contracts should incorporate these responsibilities. The operator is the entity that bills consumers for their energy consumption. For smaller communal or district energy systems, the operator may be the managing agent of the building where the heating and/or cooling plant is located.

The necessary smart metering infrastructure should be in place to enable the collection of the indicators outlined above. This should be in line with the metering plans produced at as-built stage.

The reporting period for energy centre RUs begins when the connected customers' consumption totals 50% of the energy centre's proposed output at design stage or within five years of the energy centre supplying its first consumer, whichever is sooner.

6.3 Residential and non-residential reportable units

For all residential and non-residential RUs, the in-use performance indicators are presented in Table 7 and should be reported separately for each RU. As per the as-built requirements, the indicators for plant performance, renewable energy generation and energy storage equipment relate to systems directly linked to the RUs (i.e. houses supplied by individual heating systems, PV panels connected to individual dwellings, retail units supplied by individual heat pumps etc.) rather than systems linked to centralised arrangements (e.g. energy centres etc.).

Each output should be reported against the RU that its energy generation is an input to. For instance, PV on a block of flats would usually be connected to the landlord's distribution board and should therefore be captured under the common areas non-residential RU. Directly grid connected renewables (e.g. stand-alone renewable installation connected only to the grid and not to any building) included as part of the development would also be expected to be reported as part of the development reporting requirements.

Table 6.2 : **Table 7:** In-use stage performance indicators for residential and non-residential RUs

Indicator group	Description
Contextual data	• Update of GIA (m2) for each RU, if necessary
Building energy use	• Grid electricity consumption (kWh) • Gas consumption (kWh) • Other fuels consumption (kWh) • District heating/cooling consumption(kWh) (if applicable) • Measured DEC grade and rating (for non-residential RUs only) either for the whole building or for individual tenanted uses (see paragraph 6.3.8)
Renewable energy	• Renewable electricity generation (gross) (kWh) • Solar thermal heat generation (kWh) • Renewable electricity exported (kWh) • Renewable electricity used on site (kWh)

Indicator group	Description
Energy storage equipment	• Battery storage capacity (kWh) • Net electricity flow to EVs (kWh)
Plant parameters (Energy exported)^	• District heating energy exported (kWh) • District cooling energy exported (kWh)

^ Only required in situations where the RU exports heat or cooling into a wider heat/cooling network. This is not captured by the DEC XML file and must be stated separately.

As with the energy centre(s) RUs, the necessary smart metering infrastructure should be in place to enable the collection of the indicators outlined above. This should be in line with the metering plans produced at planning and as-built stages.

Residential reportable units

To submit in-use data, and in line with national metering requirements, the developer/building owner should ensure that individual smart meters are installed in each dwelling.

For residential RUs, access to and collection of in-use performance data is challenging. One option is to engage and seek permission from occupants to access their energy performance data, including in-use energy consumption, renewable energy generation and energy storage equipment capacity. This will require occupant consent on an annual basis and the results should be aggregated for each RU before being reported. This is because any data from dwelling-level smart utility meters (e.g. electricity and gas meters) is strictly controlled through the Data Communications Company (DCC) to provide data privacy.

Where energy is provided from a district energy supply (either third-party or communal supply within a block of flats/group of houses), the developer/building owner will be expected to obtain the metered energy consumption provided by the network from the district heating provider (aggregated to RU level), for each residential RU served by a district heating or cooling system. This could be taken from a physical upstream meter (see below), or by summing the consumption billed to each consumer in each RU. As long as each RU includes at least five customers, privacy will be maintained.

An alternative solution to accessing data from individual dwellings would be to meter groups of properties by installing upstream meters in the distribution network – for example an entire block of flats or street of houses. The GLA is currently in discussions with UK Power Networks (UKPN) to investigate this. Programmes of automatic metering scalable across London and operated by a single supplier are also being investigated. The outcomes of these investigations may result in changes to the in-use reporting process and this guidance will be updated as appropriate.

Non-residential reportable units

In submitting in-use data, developers/building owners for non-residential RUs comprising whole buildings with a single occupier and either >250m2 gross internal floor area (GIA) or buildings with <250m2 GIA but contributing more than 5% of total carbon emissions of the development, are required to commission an official DEC.

In submitting in-use data, developers/building owners for a building / facility > 250m2 GIA with multiple tenants, are required to:

- Produce a Landlord Energy Statement (LES)13, a tool that enables landlords to give their tenants who need to prepare a DEC an industry standard summary of their share of the energy provided by the landlord's services to the whole facility.
- Commission an official DEC for each tenant's premises. This can be done either by the developer/building owner mandating each tenant to produce their own DEC, once they have provided tenants with their individual LES, or by mandating tenants to share their annual energy purchases with the developer/building owner, in which case the landlord should commission all official DEC certificates.
- Commission an official DEC for the whole building/facility. This will be comparable on a like-for-like basis with the whole building/facility DEC predicted at as-built stage, albeit the latter would have assumed generic tenants for tenancies where leases had not been signed.
- Submit the DEC xml data file(s) from the DEC software as per the as-built process.
- Determine renewable electricity exported and used on-site, capacity of battery storage, net electricity flow to EVs and district energy exported (if present) based on the developer/contractor design team or manufacturer's estimates.

The information that will be made available from the DEC xml file and that which should be collected by the developer/contractor is presented in Table 8.

Table 6.3 : **Table 8:** Data source for non-residential performance indicators

			Sources of information	
Indicator group	Individual indicator	Unit	**DEC xml**	Developer / Contractor
Contextual data	Floor area (GIA)	m2	y	
Building energy use	Grid electricity consumption (input)	kWh	y	
	Gas consumption (Input)	kWh	y	
	Other fuel consumption (input)	kWh	y	
	District heating consumption	kWh	y	

			Sources of information	
Indicator group	Individual indicator	Unit	**DEC xml**	Developer / Contractor
District cooling consumption	kWh	y		
DEC grade and rating	A to G; rating	y		
Renewable energy	Renewable electricity generation (gross)	kWh	y	
	Solar thermal heat generation	kWh	y	
	Renewable electricity generation (export)	kWh		y
	Renewable electricity generation (used on site)	kWh		y
Energy storage equipment	Battery storage capacity	kWh		y
	Net electricity flow to EVs	kWh		y
Plant parameters (Energy exported)^	Total district heating output	kWh		y
	Total district cooling output	kWh		y

^ Only required in cases where the RU exports heat or cooling into a wider heat/cooling network. This is not captured by the DEC XML file and must be stated separately.

7. Best practice guidelines

7.1 About this section

The previous sections set out the minimum requirements to comply with the ‘be seen’ policy. However, developers are encouraged to consider and implement additional best practice industry guidelines. Depending on the RU typology and scale, there are various initiatives which, if implemented, could lead to greater levels of accuracy in terms of energy performance estimates.

7.2 Setting a DEC target rating at planning stage – non-residential developments

The ‘be seen’ process requires applicants and developers to produce and submit DEC certificates and the associated DEC grade and rating at as-built and in-use stages for non-residential RUs.

For all non-residential RUs, applicants are encouraged to go further than this minimum requirement by submitting, as part of the planning stage, a target DEC rating in the form of a whole building DEC grade (e.g. an “A” or “B” and potentially a rating as well).

The mechanism of producing a DEC rating from the early stages provides a target baseline to work from which the design team can sign up to and which can be transferred as and when ownership of the development changes. This approach leads to a clear, well understood target to compare against as the design progresses.

The Best Practice DEC target for a new office building is B4014 (DEC Grade B, Rating 40). Similar high performing targets could be adopted for other building types.

7.3 Design for Performance (DfP) – office developments

??????The DfP is a Better Buildings Partnership (BBP) initiative funded and backed by industry and established to tackle the ‘performance gap’ and ensure new office developments deliver on their design intent. The project emulates international best-practice demonstrated by the National Australian Built Environment Rating System (NABERS15) Energy Rating and Commitment Agreement that has transformed the prime office sector in Australia.

The DfP approach sets a base building energy rating at the start of a project which is then embedded in contractual requirements, design tools and independent verification of the measured rating by an accredited assessor.

The scope of the base building rating is illustrated in Illustration 3. The base building is the responsibility of the building owner/landlord and covers whole building HVAC and all energy used in the common parts including lights, small power, lifts, external lighting, dedicated car parks, standby generator, etc. The tenants are responsible for their energy use for their lighting and power inside their premises.

Illustration 3: Base building rating scope (NABERS)

As an alternative to submitting a target DEC rating (as outlined in section 7.2) the GLA encourages planning applicants putting forward office16 buildings with a GIA of >5,000m2 to submit, as part of the planning reporting process, a DfP target base building rating instead. Applicants choosing to follow this methodology,

will be required to measure and disclose the base building rating throughout all ‘be seen’ reporting stages (i.e. as-built and in-use), as they would for a DEC grade and rating.

Similar to the DEC process, an xml file is also created for an official DfP base building energy rating. Applicants will need to follow the same DEC process to extract the relevant information from the base building energy rating xml file to report on the relevant non-residential RUs’ indicators. The best practice DfP base building rating target for a new multi-let office > 5,000m2 GIA is 5 stars[17].

In line with the DfP requirements, applicants and developers should ensure that the appropriate metering arrangements are in place to permit the necessary energy metering and base building rating to be determined. Applicants and developers are also encouraged to consider using the full DfP process as it includes “advanced simulation” (detailed HVAC plant and control modelling) and goes beyond the minimum requirements of a Part L model (used for CIBSE TM54).

For further information please refer to the Better Buildings Partnership website[18].

7.4 Advanced modelling simulation

??????Advanced simulation, particularly in large-scale buildings, should permeate a building’s development from concept design through to achieving the performance target in-use. The use of detailed simulation of HVAC plant and controls is expected to provide far greater insight into a building’s likely energy performance. The detailed model predictions provide a continual reference point for value engineering considerations, commissioning, fine-tuning and expectations once the building is in operation and can lead to a narrower performance gap. The principles of advanced modelling simulation can be applied to any building typology.

The GLA encourages developers of all non-residential building uses (other than offices) of at least 5,000m2 GIA to estimate annual energy consumption (kWh) and intensity (kWh/m2) by undertaking an advanced simulation (detailed HVAC plant and control modelling) during the as-built stage. Guidelines are set out in the BREEAM Guidance Note 32 (GN32). These modelling principles can be applied to any non-residential building in order to obtain detailed insight and a robust prediction of operational performance.

7.5 Integrated smart energy systems

Currently, smart meters (SMETS2) with an in-home display have to be provided for new homes and advanced meters / half-hourly meters are provided for non-residential buildings. Such systems help raise awareness and make users responsible for their energy consumption.

The GLA encourages developers to consider smart energy systems that provide integration between different systems, including landlord/owner and tenant/occupant, electric vehicle charging points, security systems, white goods (if installed), etc. Separate submetering for heating & hot water for residential uses and submetering to allow energy consumption by use type for non-residential buildings is also encouraged.

Ideally the system should provide secure, remote access to data and should allow occupants and building owners to access this data. It should also provide secure, remote communication of consumption data between the meter and the supplier.

7.6 Occupant overheating feedback

Smart building functions allow occupants of residential and non-residential developments to report issues with overheating and/or internal temperature monitoring. This is standard process for non-residential buildings where overheating issues are usually reported to the building manager who controls the plant and equipment.

Developers/building owners are encouraged to implement solutions which allow occupants to communicate issues associated with overheating to the building owner. This could be done through the building management system (BMS) by undertaking occupant surveys to identify overheating concerns, or by setting up an online system allowing occupants to flag issues that can then be investigated.

7.7 Other in-use best practice methodologies

A number of other best practice methodologies exist, which are applicable to all non-residential building typologies and which developers may want to consider, including:

The CIBSE TM22 Energy Assessment and Reporting Methodology which provides a method for assessing the energy performance of an occupied building based on metered energy use and a “bottom up” assessment of the installed plant and equipment present in the building. The approach is supported by a software tool.

Soft Landings provides a step by step process for clients and their project teams to follow in order to tackle issues driving the performance gap at all stages of the design and construction process.

8. Appendix 1 – Summary of indicators for all ‘be seen’ stages

The table below includes a high-level summary of the reporting requirements for the three ‘be seen’ stages for all RU types. This table intends to capture the overarching similarities between various stages and RUs. For further detail on what is required at each stage, please refer to relevant section.

Table 8.1 : Appendix table 1

	Planning stage	As-built stage		In-use stage	
Indicator	All reportable units	Energy centre(s) reportable units	Residential and non-residential reportable units	Energy centre(s) reportable units	Residential and non-residential reportable units

Contextual data	• Location UPRN or Address • Site plan • Planning Use Class • GIA for each Use Class • Anticipated target dates for each ‘be seen’ reporting stage	Confirmation that a verified metering plan is in place	• GIA for each RU • Confirmation that a verified metering plan is in place		GIA update for each RU-
Building energy use	• Grid electricity consumption • Gas consumption • Other fuels consumption • Energy generation • District heating/ cooling consumption (if applicable)		(SAME AS PLANNING STAGE plus:) Predicted DEC grade and rating (for non-residential RUs only)		(SAME AS PLANNING STAGE plus:) Measured DEC grade and rating (for non-residential RUs only)

Renewable energy use	-	• Renewable electricity generation (gross) • Solar thermal heat generation	(SAME AS AS-BUILT STAGE plus): • Renewable electricity exported • Renewable electricity used on site
Energy storage	-	• Battery storage capacity • Net electricity flow to EVs	

Plant parameters	-	a.1. Grid electricity consumption a.2. Gas consumption a.3. Other fuels consumption b.1. Delivered efficiency of each heating/ cooling) generation plant b.2. % of heat supplied from each heating/ cooling generation plant c. Predicted losses from heat/cooling distribution pipework d. District heating/cooling energy import/export	District heating/ cooling energy exported	a. (SAME AS AS-BUILT STAGE) b.1. Energy input/output to/from each heating/cooling energy conversion plant c.1. Total district heating/ cooling output from production centre c.2. Total district heating/ cooling supplied to customers d. (SAME AS AS-BUILT STAGE)	(SAME AS AS-BUILT STAGE)

Carbon	• Carbon emissions estimates for residential, non-residential and whole development • Carbon shortfall for the entire development • Estimated carbon offset amount		• Carbon shortfall for the entire development • Confirmation of carbon offset amount	-	-

9. Appendix 2 – Application of RUs to typical development examples

This appendix provides indicative examples of how RU definitions could be applied to a range of different development scenarios.

The residential RU definitions include a deliberate element of flexibility to enable developers to group residential and non-residential elements in a logical manner to account for phasing and physical layout of the development. The following examples have been set out on the basis of achieving compliance with the minimum requirements of the ‘be seen’ policy while observing data privacy requirements.

In non-residential buildings, it is common for a mixture of tenants with differing use activities to be present within a larger building or complex. In some cases, a tenancy can be separated entirely from the other aspects of a building or complex. A typical example is retail units on the ground floor of a larger office building. Where these units are designed to be entirely independent from the rest of the building e.g. have their own independent utility supplies, access and HVAC services, each self-contained unit can be treated as a separate RU to the remainder of the building.

The converse case is where a unit shares access, HVAC systems or an energy supply with other aspects of the building in which case it would be treated as a tenancy within the larger building for the application of ‘be seen’. In order to robustly share the landlord energy consumption in these cases, the Landlord Energy Statement is used.

Example 1: Single block of flats of 25 units with individual heating systems

The 25 residential units in the block comprise one residential RU.

The common areas of the block comprise a non-residential RU. This is assessed against de-minimis thresholds; if it is deemed de-minimis then only renewable energy data would be reported for this element.

Example 2: Single block of flats of 25 units with individual heating systems and a gym as part of the communal area

The residential units in the block comprise one RU.

Where the gym is self-contained this can be treated as a separate non-residential RU to the common areas of the block of flats and there are therefore two single tenanted non-residential RUs present (the common areas and the gym). Each would be assessed against de-minimis thresholds.

Where the gym is not self-contained, the common areas and gym would be treated as a single RU. Where the gym is operated by a separate company to the common parts of the building there would be two tenants in the RU. Where the same organisation operates both elements it would be a single tenant RU.

Example 3: Single block of flats of 100 units with communal heating system

The residential units in the block comprise one RU.

The common areas of the block of flats comprise a non-residential RU. If this is deemed de-minimis then only renewable energy data would be reported.

The communal heating system comprises an energy centre RU.

Example 4: Single occupier office/leisure centre with separate café/retail on ground floor

There are two approaches available depending on how the café/retail unit is provided with energy and HVAC services.

1. Where the café/retail unit is self-contained, the office/leisure centre and café/retail unit would each be defined as their own RU and reported separately. Two DECs would be prepared supported by a Landlord Energy Statement.
2. Where the café/retail unit is not self-contained, the building is a single RU with two tenants. A single DEC would cover the whole building which would be considered mixed-use (office/leisure centre + café/retail unit).

Example 5: Multi-let office/retail building

Where the office/retail units are self-contained each office/retail unit would be defined as its own RU and reported separately. Each unit would be assessed against de-minimis thresholds separately (<250m2 and <5% of projected total carbon emissions for the development).

Where a landlord has responsibility for energy consuming common facilities such as car parking, external lighting, signage or management offices (this is commonly the case in retail parks), a LES should be prepared and the landlord energy use allocated to each office/retail unit and included in the DEC of each RU.

Example 6: Shopping mall

A shopping mall is treated as a multi-tenanted RU (i.e. one RU per tenant) and the energy consumed by the mall area and other landlord's services (such as car parks, etc.) is assigned to the tenancies using the LES. A DEC certificate would be required for each separate RU.

Example 7: Mixed-use development (residential and non-residential) with single energy centre supplying entire development

The residential dwellings in each residential block of over five dwellings comprise one RU. Any blocks with fewer than five dwellings should be combined with an adjacent block until the threshold is met.

Any independent residential units (houses) are combined into a single RU of five or more dwellings.

The common areas of each residential RU are treated as a separate non-residential RU. If this is deemed de-minimis then only renewable energy data would be reported under 'be seen'.

The energy centre comprises an energy centre RU.

Each non-residential building or self-contained non-residential tenancy is assessed against the 'be seen' criteria to determine whether it qualifies as a single occupier or multi-tenanted (office or non-office) RU.

Example 8: Mixed-use development (residential and non-residential) with one energy centre per block and retail units supplied by individual systems

The residential dwellings in each residential block of over five dwellings comprise one RU. Any blocks with fewer than five dwellings should be combined with an adjacent block until the threshold is met.

Any independent residential units (houses) are combined into a single RU of five or more dwellings.

The common areas of each residential RU are treated as a separate non-residential RU. If this is deemed de-minimis then only renewable energy data would be reported under 'be seen'.

The energy centres serving each block would comprise individual energy centre RUs (i.e. one RU per energy centre).

Each non-residential building or self-contained non-residential tenancy is assessed against the 'be seen' criteria to determine whether it qualifies as a single occupier or multi-tenanted (office or non-office) RU.

10. Appendix 3 – FAQs

Question 1: Who is responsible for providing data at various stages of the ‘be seen’ process?

Responsibility for providing the data at each stage of the process is set out in the tables below.

Energy centre(s) RUs

Table 10.1 : **Table 9:** Responsibility for providing data associated with energy centre(s) RUs

‘Be seen’ stage	Responsibility
Planning	Planning applicant
As built	Developer
In-use	Network operator

Residential RUS

Table 10.2 : **Table 10:** Responsibility for providing data associated with residential RUs

‘Be seen’ stage	Owner occupied	Private rented sector	Social housing
Planning	Planning applicant		
As built	Developer		
In-use	Freeholder (via e.g. building management company)	Freeholder (e.g. building head lease owner)	Freeholder (e.g. social housing operator)

Non-residential RUs

Table 10.3 : **Table 11:** Responsibility for providing data associated with non-residential RUs

‘Be seen’ stage	Owner occupied	Private rented sector	Social housing

Planning	Planning applicant
As built	Developer
In-use	Building owner*

*In-use reporting for premises in a multi-let non-office (e.g. shopping/leisure centre) can be delegated through lease terms by the building owner to each tenant in which case the building owner must provide each tenant with a Landlord Energy Statement (LES).

The responsibility for reporting will be secured through condition or legal agreement between the responsible party (i.e. owner) and the local authority and should be clearly defined. Although each responsible party may identify an alternative person who is responsible for monitoring and reporting (e.g. design team, specialist service, energy manager etc.) the ultimate responsibility will lie with the owner.

Question 2: What happens if a development has multiple owners?

Responsibility for reporting data for each RU sits with the owner who holds the management responsibility for that RU. See definition of an RU in section 3.5 and Appendix 2, where examples of how a development might be separated into RUs are set out.

Question 3: What is the verification process to ensure good quality data?

It is in the developer's interest to ensure that the reported performance at all 'be seen' stages is based on a true representation of the best available data to enable a reduced gap in performance and optimal in-use operation. As such, developers are encouraged to adopt third-party verification mechanisms to ensure accuracy in their submissions.

In addition, verification methods are inherent in a number of the 'be seen' requirements:

- At as-built stage, the Part L calculations used to predict the output of renewable energy technologies, and the SAP calculations used to predict the regulated energy uses for residential buildings are undertaken by accredited assessors and subject to third-party audit.
- At the in-use stage, DEC assessments are undertaken by accredited assessors operating under the oversight of third-party external audit schemes. Minimum standards are set on the data quality required in order to produce a rating.
- District heating and cooling systems are subject to The Heat Network (Metering and Billing) Regulations 2014. This states that "Where a meter to which these regulations apply is installed it must accurately measure, memorise and display the consumption of heating, cooling or hot water by a final customer" and ensures that good quality billing data is available on which 'be seen' reporting should be based.

Where clearly defined verification methods exist (e.g. the CIBSE TM54: Evaluating Operational Energy Performance of Buildings at the Design Stage) these have been specified in the guidance to ensure consistency. Some of the 'be seen' indicators are reliant on the best estimates of design teams (e.g. energy storage technologies and predictions of performance for district heating and cooling systems) which is why developers are encouraged to adopt third-party verification mechanisms.

Question 4: When does the five-year reporting period begin?

For residential RUs, the developer/building owner should begin monitoring once the DLP is complete. They should then report for the first time 12 months after the DLP is complete and then every year for a further four years. This allows enough time for the properties to reach full occupancy within the monitoring period.

The reporting period for energy centre RUs begins when the connected customers' consumption totals 50% of the energy centre's proposed output at design stage or within five years of the energy centre supplying its first consumer, whichever is sooner.

For non-residential RUs, reporting applies from the point at which a DEC can be provided during the in-use stage. DECs cover a year during which the whole building is considered occupied for at least 11 months. Whole building DECs identify weighted annual hours of use for the entire building. A tenant DEC in a multi-tenanted non-office facility ensures that only occupied space is included.

Question 5: How is data anonymity and protection ensured?

Residential reportable units

- Data will be submitted to the GLA at RU level (e.g. each unit incorporates at least five dwellings). This ensures anonymity of the data for any individual dwelling.
- Developers/building owners should ensure that metered data submitted by individual residential occupants is held and processed in accordance with the consent document provided to each participating occupant and is aggregated to a RU before it is submitted to the GLA.
- Data on district heating or cooling consumption is only requested on an aggregated basis to ensure that data from an individual dwelling is not disclosed.

Non-residential reportable units

- The only data privacy issues envisaged for non-residential units relate to national security buildings (e.g. Ministry of Defence buildings) and premises with commercial sensitivity (e.g. industrial process buildings). Planning applications for these typologies are generally scarce in London. Should these come forward, they will be reviewed on a case by case basis.

11. Glossary

11.1 Abbreviations

BEIS - Department for Business, Energy & Industrial Strategy
BBP – Better Buildings Partnership
BPF – British Property Federation
BMS – Building Management System
BREDEM – BRE Domestic Energy Model
CCC – Committee on Climate Change
CIBSE – Chartered Institution of Building Services Engineers
CO2 – Carbon Dioxide
DCC – Data Communications Company
DEC – Display Energy Certificate
DfP – Design for Performance
DHN – District Heating Network
DLP – Defects Liability Period
EPC – Energy Performance Certificate
EV – Electric Vehicle
GIA – Gross Internal Area
GLA – Greater London Authority
HVAC – Heating Ventilation Air-Conditioning
IPCC – Intergovernmental Panel on Climate Change
LBSM – London Building Stock Model
LES – Landlord's Energy Statement
NABERS – National Australian Built Environment Rating System
PV – Photovoltaic
RU - Reportable unit
SAP – Standard Assessment Procedure
SMETS - Smart Metering Equipment Technical Specifications
TM – Technical Memorandum
UKPN – UK Power Networks
UPRN – Unique Property Reference Number
WLC – Whole Life-Cycle Carbon

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References

- 1 Innovate UK: Building Performance Evaluation Programme: Findings from non-residential projects Getting the best from buildings, p21, January 2016
- 2 According to the CCC report, closing the energy use performance gap in new homes could save between £70 and £260 in energy bills per household per year.
- 3 /sites/default/files/ugf_calculator_version_1_march_2021.xlsx

- 4 The three year period has been selected to support the practicality of monitoring the performance of the whole RU in a timely manner.
- 5 Statistics of Trade Act, 1947 10 & 11 GEO. 6. Ch. 39 page 7: para 9 (disclosure of information) section 5(a)
- 6 Unheated common areas are expected to almost certainly be de minimis in terms of carbon emissions hence they would be excluded, provided that the expected consumption didn't exceed the de minimis thresholds (see 0). Open access decks are, by definition, excluded from the GIA and therefore do not constitute part of a building. Furthermore, these would in most cases be de minimis.
- 7 The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007: http://www.legislation.gov.uk/uksi/2007/991/contents/made
- 8 This is likely to be most material for multi-residential buildings with on-site renewables.
- 9 https://www.gov.uk/government/collections/quarterly-energy-prices
- 10 https://www.bre.co.uk/page.jsp?id=3176
- 11 A de minimis threshold applies where the floor area of a RU is less than 250m2 GIA and the expected emissions for the unit are less than 5% of the development's total emissions. De minimis buildings are only required to report energy generation from renewable energy technologies, if applicable.
- 12 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/452481/DEC_G
- 13 The LES was developed by the British Property Federation (BPF) to provide a methodical way to allocate landlord purchased energy to each tenant in a multi tenanted building. The LES is a precursor to producing a DEC for each premises. The DEC for a premises accounts for the energy purchased directly by the tenant of that premises, plus (if applicable) the energy supplied to the premises by the landlord, plus the premises fair share of the energy used by the landlord within the common parts of the facility. The LES covers the latter two elements. For more information: http://www.les-ter.org/page/home.
- 14 Recommended by LETI, UKGBC and RIBA.
- 15 https://www.nabers.gov.au/
- 16 Separate use classes for commercial uses including retail and offices have now been replaced by use class E. The most relevant building typology or use should be selected in providing data. Consequential amendments to the reporting templates will be considered once the related changes to Building Regulations are published.
- 17 5 stars is the recommended minimum base building rating for commercial offices in operation from 2025. See https://www.ukgbc.org/ukgbc-work/net-zero-carbon-energy-performance-targets-for-offices/ (UKGBC, January 2020)
- 18 See Summary report available from http://www.betterbuildingspartnership.co.uk/node/360