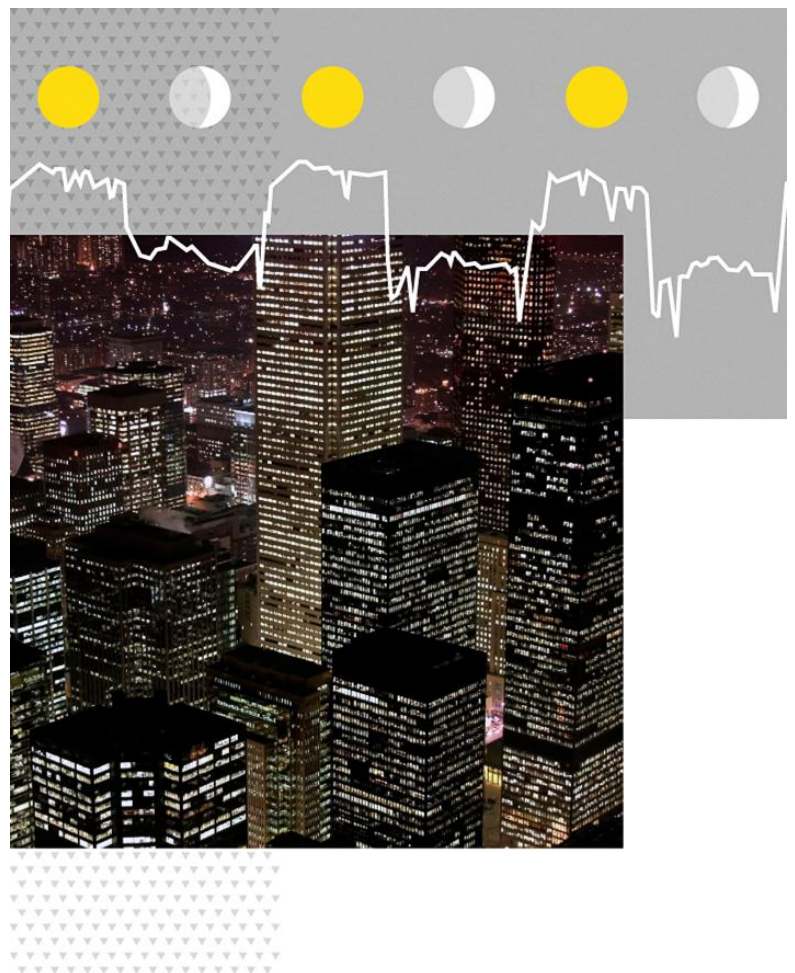


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## Introduction to the Landlord Energy Rating

A summary document that provides an overview of the Landlord Energy Rating excel tool

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## Contents

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1.	Introduction.....	4
1.1	Purpose of this document .....	4
1.2	Background .....	4
2.	Scope of the Landlord Energy Rating .....	5
2.1	Minimum Energy Coverage Requirements.....	5
2.2	Determining Landlord Energy Consumption.....	5
2.3	Accounting for tenant supplements to landlord services.....	6
3.	Excel tool overview .....	8
3.1	Welcome sheet .....	8
3.2	A - General information.....	8
3.3	B - Landlord supplies .....	8
3.4	B1 – Tenant energy supplies .....	9
3.5	C – Additional energy data.....	9
3.6	D – Separables.....	9
3.7	E – Additions and subtractions.....	10
3.8	F – Data for benchmarking.....	11
3.9	Pre-certificate.....	12
3.10	Certificate .....	12
4.	Calculation methodology.....	13
4.1	Benchmark adjustments .....	14
4.2	Actual energy performance .....	14
4.3	LER rating score .....	14



# 1. Introduction

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## 1.1 Purpose of this document

This document is an introduction to the Landlord Energy Rating (LER) excel tool. Section 1 summarises the background and the current state of development. Section 2 gives an overview of the LER and its scope. Section 3 is a user guide of the MS excel tool and the function and content of each of its constituent sheets. Section 4 summarises the calculation methodology.

## 1.2 Background

The Better Buildings Partnership (BBP) strongly supports the roll out of Display Energy Certificates (DECs) to the private sector, but believes that, in their current form, they may not achieve their vital aim of driving market change in reducing energy consumption, in addition to their primary purpose of reporting operational energy use. Our members believe that by making energy performance data accessible and simple to understand it will influence both owners and occupiers to increase efficiency. The BBP has, therefore, taken the findings of the UKGBC Task Group Report 'Carbon Reductions in Existing Non-Domestic Buildings (March 2011)' and has initiated a project which it hopes will result in the development of a methodology which can be used to produce a robust 'Landlord DEC'.

In this context, the BBP is seeking to develop a Landlord's Energy Rating (LER). The project will focus on the multi-let office sector, but the intention is to address other sectors over time. The LER aims to differentiate energy efficient office space in the marketplace, creating the potential to feed through into market valuations, as the NABERS<sup>1</sup> Energy system is reported to be doing in offices in Australia. The LER project is looking to build upon the existing Landlord's Energy Statement<sup>2</sup> (LES) and be consistent with the DEC operational rating, to develop a LER which provides additional granularity to that available from whole building or tenant DECs by focusing on the energy use which can be influenced by the landlord.

By virtue of sharing a common data collection platform, the LER is designed to be completed at the same time as a whole building and/or tenant DECs, although the LER delivery system may remain separate, at least initially. It is hoped that it could be complementary to compliance with other legislative requirements such as CRC-EES and potentially the requirement for energy audits under the EED.

The LER has completed its second stage of development. In the first stage issues associated with the rating of landlord services were identified. Based on this analysis a specification for LER was produced. In the second stage, the specification was used to develop a prototype MS excel based tool. The prototype was tested, through a desk based data collection exercise that covered 97 buildings and 5 detailed site based case studies, and then refined. This document provides an introduction to the use of that tool.

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<sup>1</sup> National Australian Built Environment Rating System

<sup>2</sup> [www.les-ter.org.uk](http://www.les-ter.org.uk)



## 2. Scope of the Landlord Energy Rating

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The LER includes the energy used to provide a full set of landlord's services for the Base Building (i.e. all services in the common parts of the building and all shared HVAC services). This includes every external energy source supplying the site, all sources of renewable energy generation sources harvested on site and, where possible, details of all landlord end uses.

### 2.1 Minimum Energy Coverage Requirements

All energy consumed in supplying building central services to office lettable and common spaces should be included, such as:

- common-area lighting and power (including lift lobbies, plant rooms and common-area toilets)
- vertical transportation eg lifts and escalators
- heating (including HWS), cooling and ventilation which ensure the whole premises are safe and comfortable for office work, typically to a BCO specification<sup>3</sup>
- exterior lighting
- exterior signage provided by the building owner for the benefit of office occupiers
- generator fuel where it serves central services
- car park ventilation and lighting, where internal or external car parks within the legal boundaries of the site are provided for occupier use.

### 2.2 Determining Landlord Energy Consumption

Landlord energy consumption is best derived from landlord's meters, where these serve all energy services in the common parts of the building and all shared HVAC services. However, many buildings do not have such clear metering. Here one needs to:

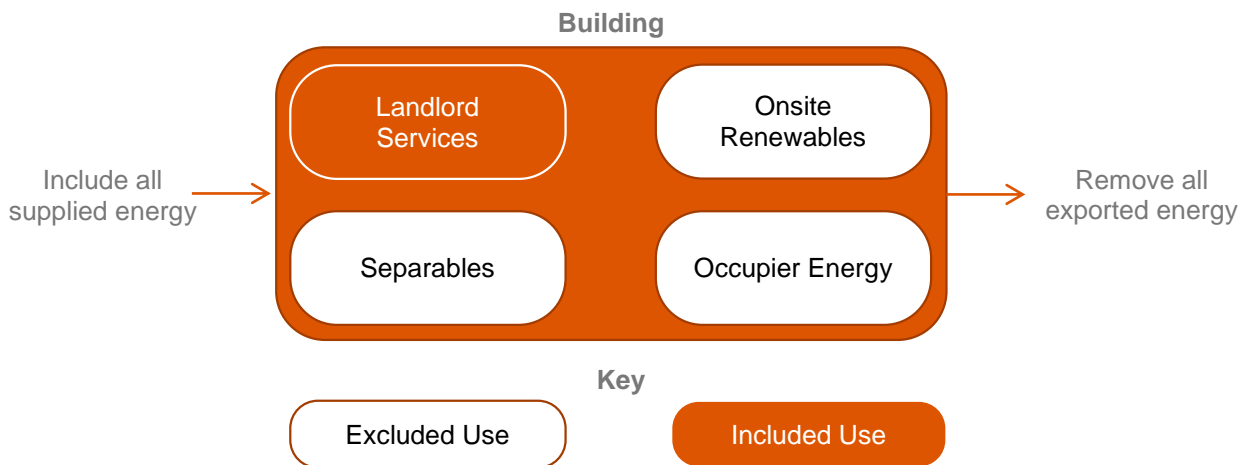
- Subtract from the total net building consumption the submetered occupier consumption<sup>4</sup> for lighting and small power in the tenant demises, and of other equipment added by the occupant (e.g. server rooms and supplementary air conditioning for high heat gain areas).
- If necessary add the energy consumption of landlord services that fall within the scope of the LER but are supplied through tenant meters.
- The remaining building energy consumption can be further reduced if separables have been identified.
- The remaining energy is then apportioned to the landlord.

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<sup>3</sup> Supplementary HVAC services to a tenant's energy-intensive areas including server rooms, dealer rooms and laboratories would not normally be provided by the landlord and so are therefore excluded.

<sup>4</sup> The default position is that a formal LER can only be completed if the metering arrangements enable it. In principle this means either that the landlord's service is fully metered or that all energy exclusive to tenants is sub-metered and therefore excludable. Stage 2 will need to consider if a de minimis uncertainty in metered energy can be allowed. As discussed in the Issues Report (section 4.2), in some cases the LER calculation will tend to give a conservative result, whilst unknown tenant supplements could produce an unfairly good result.





**Figure 2 – 1 Schematic of LER scope**

The standard calculation allocates all the benefit of any site-harvested renewable energy supplies to the landlord. On-site electricity generation equipment, such as CHP or tri-generation, will also benefit the landlord, provided the electricity equivalent of its outputs exceeds the electricity equivalent of its input. The LER process does not need to measure the inputs and outputs for such equipment – just the final result in terms of energy inputs to provide the landlord’s services within scope.

### 2.3 Accounting for tenant supplements to landlord services

Where relevant energy uses are supplemented by occupiers to ensure minimum service standards are met, then the energy used to provide these services should be captured under the Landlord Energy Rating. For example, where HVAC supplies to a tenant are supplemented by energy coming off the tenant meters and for example feeding fan coil units, electric perimeter heating, split system cooling, unitary heat pumps, and/or local ventilation plant, then the LER would be unfairly better unless the energy used for these purposes is also taken into account.

To determine the rated consumption the energy delivered to tenants, through supplies that the landlord or the tenant is counterparty, may need to be allocated to end uses. Where a tenant supplements landlord services through the use of delivered energy to provide HVAC or hot water services within their demises this consumption should also be included. The flow chart below sets out what consumption falls within the scope of the LER:



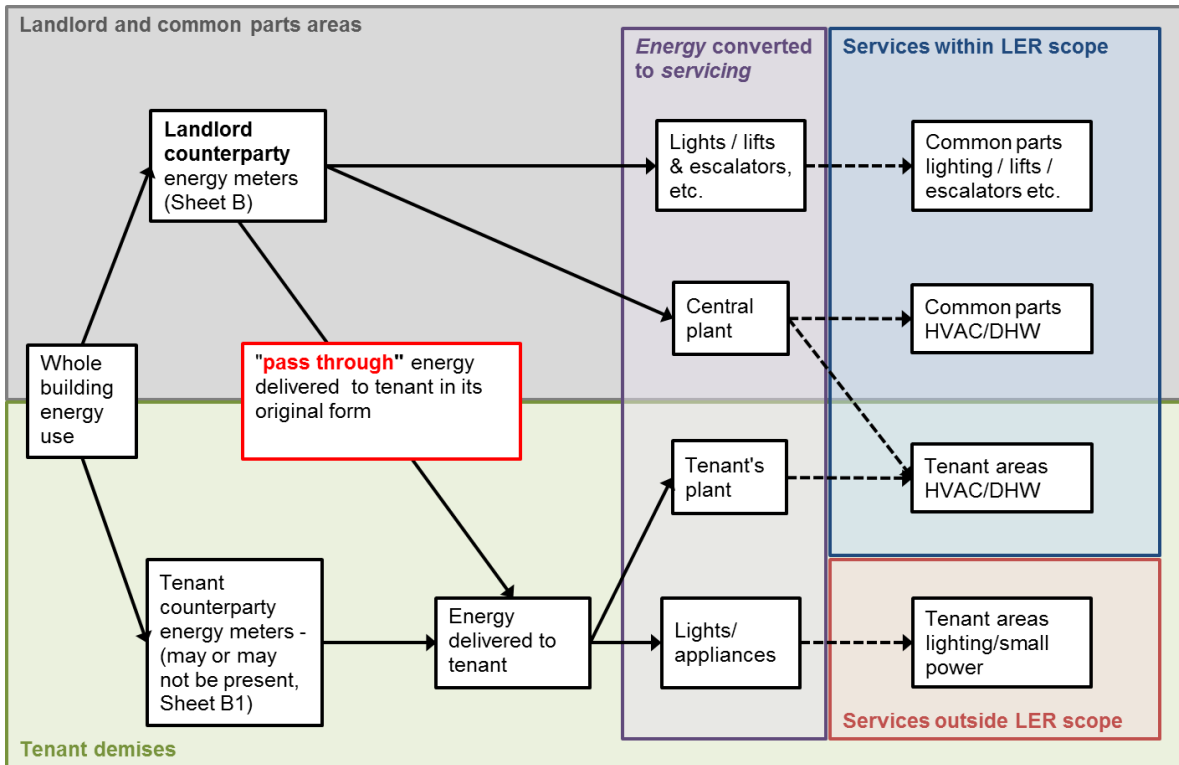


Figure 2 -1 Treatment of tenant supplements



### 3. Excel tool overview

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The tool collects data on energy supplies purchased by the landlord, energy passed through to tenants and, if known and for completeness, energy purchased by tenants.

There are ten worksheets within the tool. Sheets are either for data input or provide LER outputs. The input sheets allow users to provide information on a range of building performance factors, such as supplied energy, excludable uses and so on. The outputs sheets provide, to varying levels of detail, the performance score of the building. A summary of each sheet is provided below.

#### 3.1 Welcome sheet

This sheet introduces the tool, provides some background defines key terms, and allows users to customise sheet navigation by means of a questionnaire. Other sheets can then be accessed using the tool navigator, a flow chart where shapes can be selected to link to the relevant part of the tool. The questions, and the sheets they activate, are set out in the table below:

**Table 3 -1: Navigation questions and subsequent sheet activation**

Question	Sheets Activated
Does the building use more than 3 main energy types? (excluding on site renewables):	C – Additional Energy Data
Does the building include on-site renewables?	C – Additional Energy Data
Are any tenants counterparty to their own utility supplies?	B1 – Tenant Energy
Are separable energy uses present in the building?	D – Separables
Are any adjustments required to the landlord's energy use to correctly reflect in LER scope landlord services provision?	E – Additions and subtractions

#### 3.2 A - General information

This sheet is used to enter general information about the building. This includes;

- Building information – The address, age and floor area
- Assessor details – The name and contact details of the assessor
- Relevant stakeholders – Information on the landlord and the managing agent

#### 3.3 B - Landlord supplies

This sheet is used to define the supplies for which the Landlord is counterparty and the scope of the Landlord's services to the tenant.



Total annual energy usage is input here, with space for up to three energy sources (Sheet C is used for additional and renewable energy sources, where relevant). Annual energy consumption from each source is input, together with the relevant units and the period to which the consumption relates. If necessary the tool will interpolate or extrapolate data pro rata to 365 days.

Sheet B includes a questionnaire for users to define the scope of landlord energy services and the end uses associated with purchased supplies. Where some of the basic landlord services are provided through equipment on tenant meters, for example to fan coils and electric heating, this energy will need to be added. Conversely, if the landlord provides energy to tenants for use in small power and lighting in tenant demises, this will need to be subtracted. The calculations themselves are carried out later in the tool: Sheet B merely identifies the need to do them. Section 2.7 gives a fuller description of how additions and subtractions are applied.

### **3.4 B1 – Tenant energy supplies**

This sheet is used to define the energy supplies for which the tenant is counterparty. It is recognised that this information may often not be known to the landlord and may be difficult to collate in practice. It has been introduced into the tool to allow users to document such data in the instances that it has been recorded and shared. The data should be aggregated for all tenants. Please note, if the Landlord is counterparty to all energy supplies for the building then this sheet should not be completed.

Sheet B1 also enables users to define whether and to what degree energy supplies purchased by tenants provide local HVAC and/or hot water services that would be regarded as share services and within the scope of the LER, see Section 2.7.. Where the user can obtain the necessary details from the landlord or from the tenants concerned, these supplements should be quantified and entered on sheet E.

### **3.5 C – Additional energy data**

This sheet should be used to enter any energy supplies to which the landlord is counterparty beyond those identified in Sheet B-Landlord Supplies (2.3), or for any on-site renewables.

Up to three further energy sources and three on-site renewable generation sources can be completed. Total annual energy usage is input on this tab. The fuel consumption/generation is input along with the relevant units and also the period to which the consumption relates. If necessary the tool will extrapolate or interpolate the data pro rata to 365 days.

### **3.6 D – Separables**

This sheet is used to detail exceptional energy uses to be excluded from the building's rated energy consumption and/or floor area.

The LER has been designed to rate landlord energy services provided to the multi-let office sector. Separables relate to uses not within scope that can be excluded from the assessment: these are



either exceptional items (e.g. a telephone mast; or a tenancy containing a laboratory, data centre or large regional server room) or because the use is largely for the general public (e.g. café, retail facilities or public car park) and not strictly part of the office being assessed.

The reporting of a separable can result in either an amendment of rated floor area, an amendment in the rated consumption or both. Examples where this could arise are as follows:

- Adjustment in both – A public access facility, such as a gym, where the gym is included in the NLA. In this instance the area and consumption should be excluded.
- Adjustment in rated area – An exceptional use, which is located in tenant demises such as a regional server room. In this instance the energy consumption may already be removed by virtue of it being part of the passed-through energy supply to a tenant (using the “additions and subtractions” tab), the tool therefore only requires the net lettable area to be amended.
- Adjustment in rated consumption – An exceptional use with no net lettable area footprint. For example, a telephone mast and base station on the roof, would have its metered energy consumption should be removed but there would be adjustment to the area.

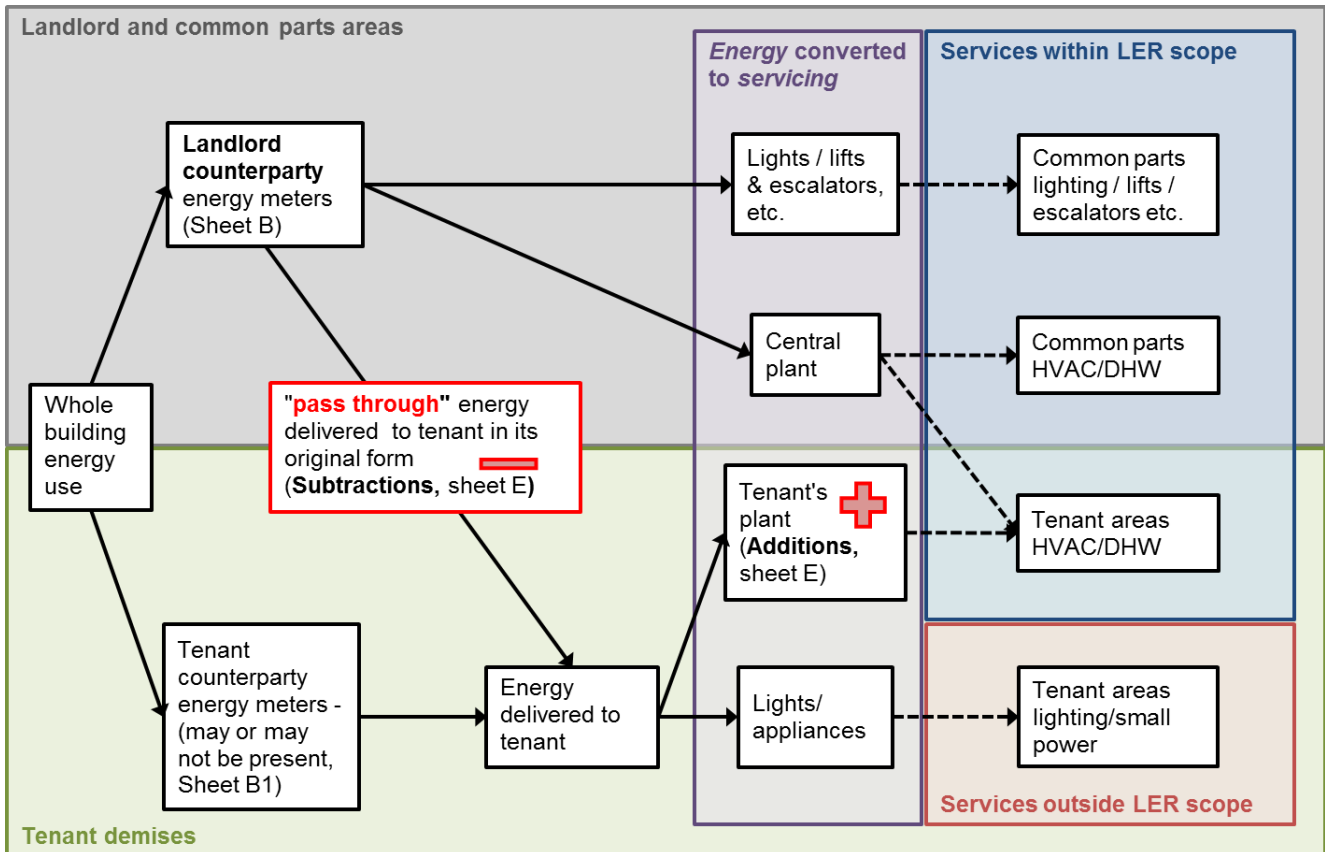
Each separable energy use is assigned an ID. This allows the tool to avoid double counting the floor area if more than one fuel is assigned to one separable energy use. It also allows users to assign a separable energy use for more than one type of energy (e.g. a trading floor may use gas for heating and electricity for small power).

### 3.7 E – Additions and subtractions

The energy purchased by the landlord may not mirror the scope of the LER, see appendix A. Adjustments include:

- subtractions, e.g. of 'passed-through energy' for tenant's lights and appliances; and
- additions, e.g. 'tenant supplements', that capture all the energy end-uses that fall within the scope of the LER .

The flow chart below represents possible energy and servicing arrangements in a building where both landlord and tenants can be counterparties for energy supplies. It identifies the circumstances where the tool will need to make subtractions or additions in order to generate a complete LER assessment.



**Figure 3 - 1: Schematic of possible energy and service arrangements and how these should be input into the tool**

Sheet E allows users to make the necessary additions and subtractions to the landlord’s purchased energy in order to reach the required scope. It includes a summary table that shows the impact of the adjustments on rated consumption. For each adjustment, information is captured as energy type (i.e. “landlord purchased energy passed through to tenant”), the fuel affected, the amount, and the period to which the data relates. If necessary the tool allows users to input conservative default energy intensity values for tenant activities that need to be estimated.

### 3.8 F – Data for benchmarking

Sheet F records further information about the building, to allow an accurate benchmark to be calculated for the LER, including adjustments for weather, voids and hours of operation. It requires:

- information on the main heating fuel. The associated dates of consumption will also set the base reporting period to which all other energy data must align and against which weather related adjustments to the benchmark will be made.
- the occupancy and hours of services associated with the tenant demises. This information can be used to adjust the benchmark, the rated areas and their consumption, see section 4.

The LER requires information on how different spaces/tenancies in the building are used throughout the assessment period. Sheet F requires users to define “functional spaces”. A functional space is any space that has a different period of letting during the year (ie where there are voids) or different

hours of use during a week. This makes it possible to define with reasonable precision how many weeks a year each parcel of floor area requires landlord HVAC services. The benchmark is calculated on the basis that landlord services should be provided only when spaces are occupied.

### **3.9 Pre-certificate**

The pre-certificate provides a detailed breakdown of all data input and the resulting building performance outputs. It includes the following:

- General Information - on the building, assessors and relevant stakeholders.
- The rating status - either provisional or accredited, including a statement on data quality: an indication of the degree to which estimation was used to determine LER performance.
- Energy and carbon summary – Information on the building’s energy use and any adjustments applied. The carbon footprint is also presented, but is not used as part of the rating.
- Benchmarking information – This includes the benchmark parameters used to calculate the LER score, a breakdown of the building floor area and details of the landlord’s services and tenant supplements.
- LER rating – The LER rating is shown along with the rated consumption by fuel in both kWh and kWh of electricity equivalent (a means of presenting energy data in one consistent unit – see section 4.2).

### **3.10 Certificate**

The Certificate states the LER rating and summarises key supporting information from the input data and calculations. It includes:

- Building details
- The current LER rating score, which is graphically presented with stars.
- LER performance in previous years
- The values for parameters
- The energy data, as kWh, kWh<sub>e</sub>, kWh<sub>e</sub> normalised by the rated area, and as tonnes of CO<sub>2</sub>.
- Details of the building owner, the assessor and the assessment

## 4. Calculation methodology

The LER calculation process:

1. Calculates the energy used by source to provide a full set of landlord's services for the Base Building (i.e. all services in the common parts of the building and all shared HVAC services). In some buildings, this may be on dedicated landlord's meters. In others, the landlord's meters may provide more or less energy than this, and additions and deductions will need to be made, as summarised on the right hand side of the schematic diagram below.
2. Converts all energy sources into a common unit (electricity equivalent), and adds them up.
3. Adjusts the Base Benchmark for the same set of services for weather and occupancy, as shown on the left hand side of the schematic diagram.
4. Calculates the ratio of the actual electricity equivalent to the benchmark, to produce the LER.

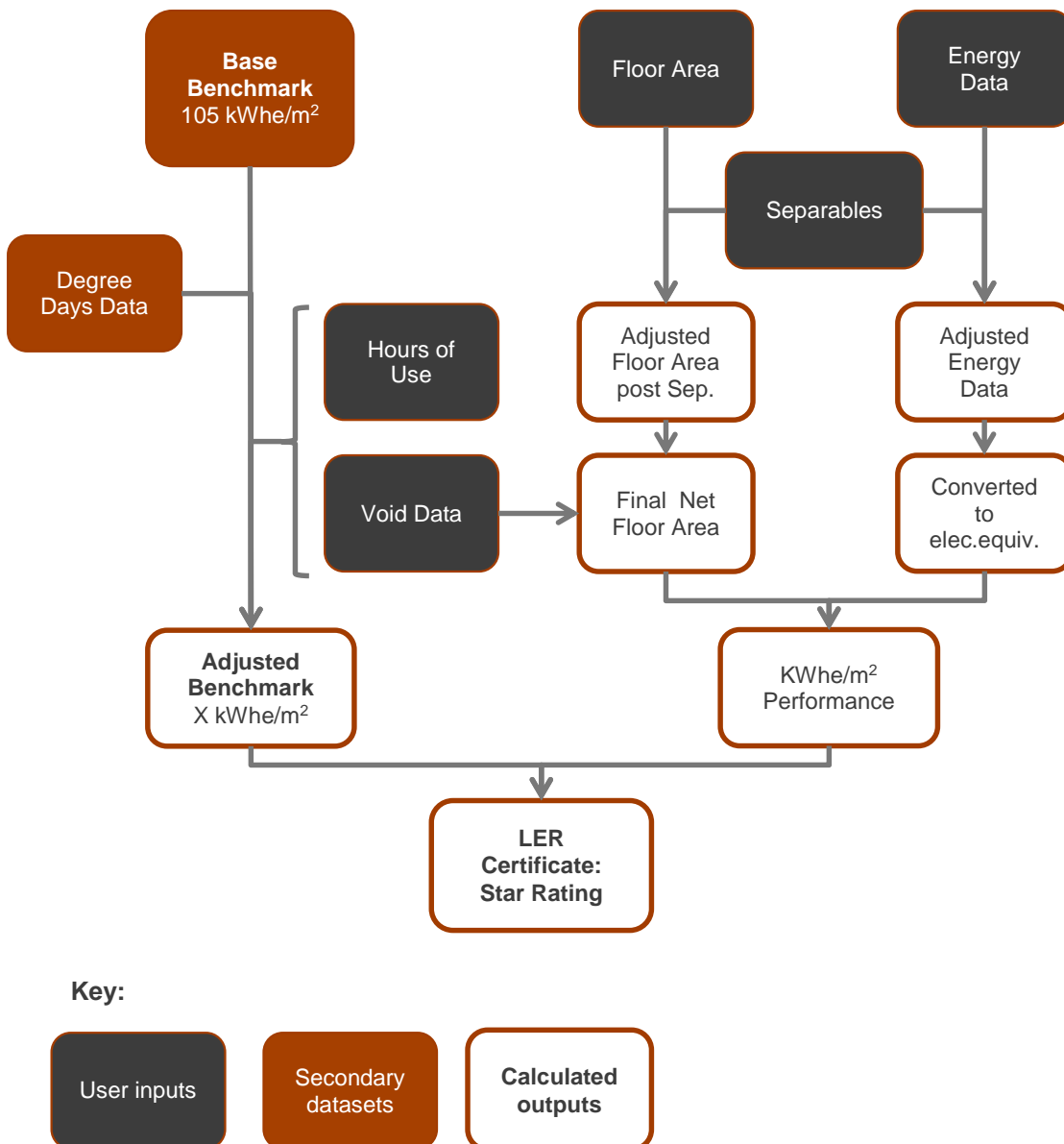


Figure 4 - 1 LER calculation process

## 4.1 Benchmark adjustments

The base benchmark indicates an average building performance normalised by floor area, all other things being equal. It has been determined using data from Display Energy Certificates, a government-accredited, national building operational performance benchmarking methodology.

The benchmark is adjusted to account for building-specific factors: weather and occupancy.

- The weather adjustment uses heating and cooling degree day data to account for regional disparities in the ambient temperature.
- The occupancy data accounts for both the agreed (contracted) hours of provision of landlord's shared services to each tenant and what voids have occurred over the year.
- The benchmark is reduced for voids and increased for extended hours of service, pro-rated in relation to the amounts of floor areas affected..
- The adjusted benchmark is then compared to actual energy performance of the Base Building.

## 4.2 Actual energy performance

The actual energy performance of the Base Building is determined from several variables. The core data inputs are Net Lettable floor Area (NLA) and annual energy data for all energy supplies provided to the site and all energy generated on site.

The energy data may need adjusting for end uses that are not within the scope of the LER. These can be excluded from the assessment as separables. The actual building data can be amended in one of three ways, depending on the separable type. The energy data can be reduced, the floor area can be reduced or both can be amended.

Once the separables have been applied, the floor area is adjusted to account for voids. If the building had vacant demises during the assessment period, then a time-and-area-weighted void factor is calculated by reducing the rated area in relation to the proportion of area affected and the period over which it was void. This is applied to the adjusted floor area to generate the final rated area.

The energy data is converted into a standard weighted energy unit, kWh electricity equivalent. This enables fair comparison of buildings with different fuel types. To do this, standard weighting factors are applied to the energy data.

The rated consumption is then divided by the rated floor area to produce the actual building energy performance score. This is compared to the adjusted benchmark to generate a LER rating.

## 4.3 LER rating score

The LER rating is expressed as a value of zero to five stars. Five stars is best and indicates the building is ~40% more efficient than the benchmark. Three and a half stars indicates that the energy use of landlord services is equal to the benchmark. Zero stars is poorest, indicating that the energy use of landlord services at least twice the benchmark value for the building. More detail on the calculation process is provided in the LER issues report and the LER specification.



