



arbn consult User Guide

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Overview

Welcome to the arbn consult software user guide.

This is your definitive guide to arbn consult. It answers your common “How To” questions and provides you with an overview of the key features.

Introduction to arbn consult

arbn consult is a decision support tool for the management of modelled energy performance risks and opportunities. It is used by consultants to quickly and efficiently gain insight into modelled energy performance, to identify buildings at risk of non-compliance with the non-domestic minimum energy efficiency standard (MEES) and to assess the potential for cost effective improvements to a building's energy performance.

What is the minimum energy efficiency standard (mees)?

MEES - also known as the The Private Rented Property Minimum Standard (PRS) is a requirement of the Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015 approved by Parliament on 26 March 2015. The legislation is intended to drive improvements in the performance of the existing stock through energy efficiency upgrades and therefore reduce emissions across the non-domestic stock.

From 1st April 2018, landlords of non-domestic buildings within the scope of the MEES Regulations (generally those buildings requiring an Energy Performance Certificate) must not let or renew tenancies if the building does not meet the minimum level of energy efficiency, defined as an Energy Performance Certificate (EPC) asset rating of E (unless the landlord formally registers an exemption).

Buildings with an asset rating of F or G must be improved with suitable energy efficiency measures to bring their asset rating up to at least an E. From 1st April 2023 the regulations will also apply to non-domestic buildings where a lease is already in place.

The basics

System requirements

arbn consult is a cloud-based platform that can be accessed via your web browser using a secure login. This means that you can efficiently store and access your building energy models from any location.


We recommend the use of the latest version of Google Chrome, Edge or Firefox web browsers but we also support Internet Explorer from version 10 onwards.

How to register to use arbn consult

In order to use arbn consult, you will first need to register.

INSTRUCTIONS

1) Navigate to the URL: <http://secure.co2estates.com/register>

The image shows a web form titled "Consultant Account Creation" for "arbn consult". The form is divided into two main sections: "General Information" and "Contact Details".
General Information
This section contains six input fields arranged in two rows and three columns:
- Row 1: *First Name (with "Name" below it), *Email address, and *Password.
- Row 2: *Surname (with "Surname" below it), *Email address confirmation, and *Password Confirmation.
Contact Details
This section contains six input fields arranged in two rows and three columns:
- Row 1: *Company Name, *Address Line 1, and *City.
- Row 2: *Post Code, Address Line 2, and *Phone Number.
At the bottom of the form is a large blue button labeled "Continue".

2) Enter your details and click 'Continue'

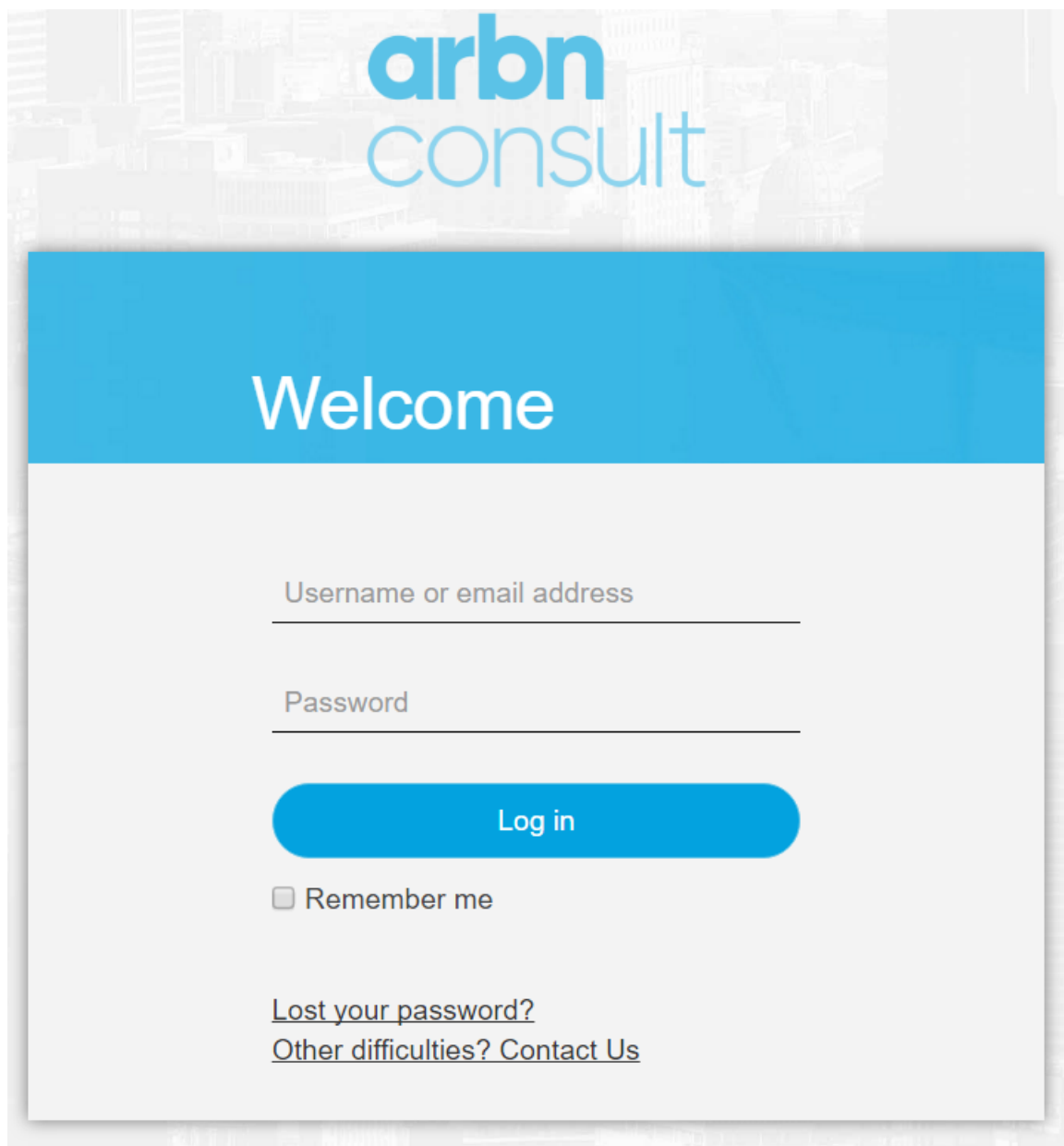
3) You will then be shown the Licence Agreement. Read and click 'Accept'.

4) You will receive an e-mail at the e-mail address you have entered, click on the link in the e-mail to confirm your e-mail address. You will then be able to log in to the platform

How to log into arbn consult

INSTRUCTIONS

- 1) Open your internet browser and navigate to the arbn consult log in page at the following address: <http://secure.co2estates.com/>
- 2) Enter your e-mail address and password as shown below and click the Log in button.

The image shows a login page for 'arbn consult'. At the top, the logo 'arbn consult' is displayed in blue text over a faded cityscape background. Below the logo is a large blue rectangular banner with the word 'Welcome' in white. Underneath the banner is a light gray rectangular box containing the login form. The form has two input fields: 'Username or email address' and 'Password', each with a horizontal line below the text. Below these fields is a blue rounded rectangular button with the text 'Log in' in white. Under the button is a checkbox labeled 'Remember me'. At the bottom of the form box are two links: 'Lost your password?' and 'Other difficulties? Contact Us', both underlined.

arbn
consult

Welcome

Username or email address

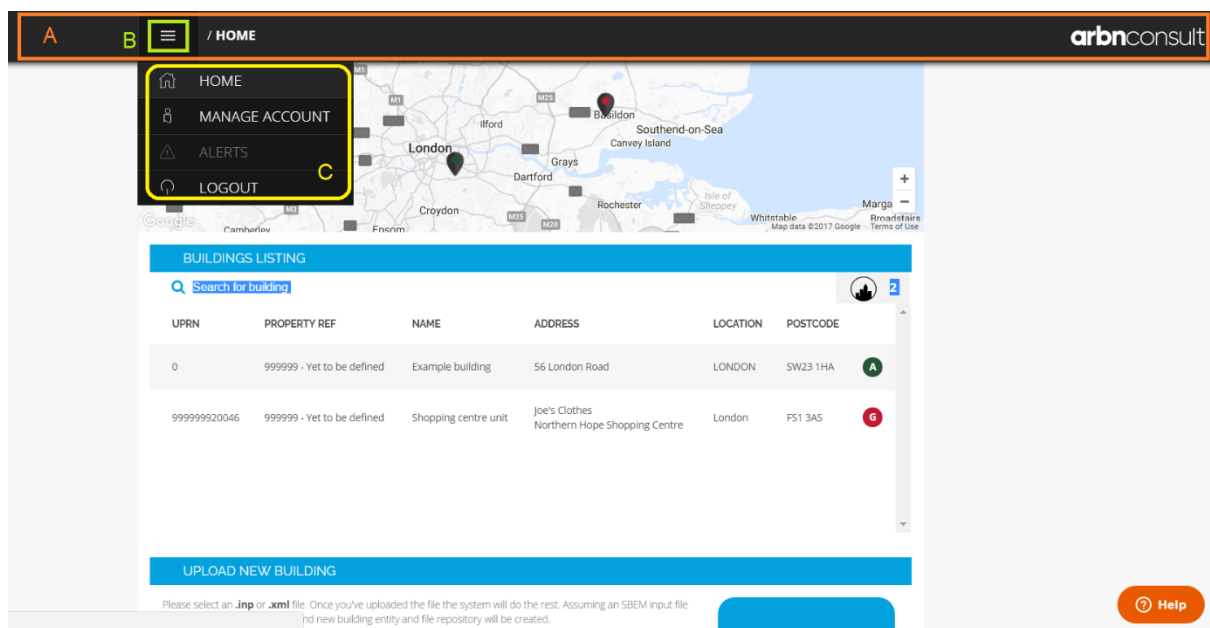
Password

Log in

☐ Remember me

[Lost your password?](#)
[Other difficulties? Contact Us](#)

How to navigate around the tool



The top menu bar (A) is used to navigate around the tool; it contains the main menu button (B) used to access the Main menu dropdown (C). There is also a 'Help' button at the bottom right of the tool in order to request assistance from arbnco.

The Main menu dropdown options are:

- Home
- Manage account

The manage account page allows you to view and modify your user details and billing details.

- Alerts

Here you will be shown your alerts for completed simulations, and you can either view the results by clicking on the 'Go to building simulation' button or dismiss the alert by clicking on the 'Dismiss notification' button.

- Logout

How to modify your user details and billing details

The manage account page allows you to view and modify your user details and billing details. Valid card details must be entered in order to upload models.

Credit card details are not stored by arbnco, nor do they pass through arbnco's servers. Credit card payments are handled by Braintree

(<https://www.braintreepayments.com>), which is a Paypal service. The only information arbnco stores are the first 6 digits of the cards to identify the card and the expiry date so we can send warnings about card expiry.

INSTRUCTIONS

1) Click the main menu button and then 'MANAGE ACCOUNT'

The screenshot shows the arbnconsult web application. The top navigation bar is dark with a hamburger menu icon on the left and the 'arbnconsult' logo on the right. A dropdown menu is open from the hamburger menu, showing options: HOME, MANAGE ACCOUNT (highlighted with a red rectangle), ALERTS, and LOGOUT. Below the menu is a map of London. Under the map is a 'BUILDINGS LISTING' section with a search bar and a table. The table has columns: UPRN, PROPERTY REF, NAME, ADDRESS, LOCATION, and POSTCODE. It contains two rows of data. Below the table is an 'UPLOAD NEW BUILDING' section with instructions and a file upload button. A 'Help' button is in the bottom right corner.

UPRN	PROPERTY REF	NAME	ADDRESS	LOCATION	POSTCODE
0	999999 - Yet to be defined	Example building	56 London Road	LONDON	SW23 1HA
999999920046	999999 - Yet to be defined	Shopping centre unit	Joe's Clothes Northern Hope Shopping Centre	London	FS1 3AS

2) In order to modify Billing Details, click 'Edit' at the bottom of the 'Billing Details' section. Similarly, in order to modify User Details, click edit at the bottom of the 'Billing Details' section.

The screenshot shows a web interface for managing an account. At the top, there's a dark header with a menu icon and the text "/ USERS". Below this is a blue bar labeled "MANAGE ACCOUNT". Underneath, there's a profile icon and the name "Buildings". The main section is titled "BILLING DETAILS" in a blue bar. Below this, there's a form with the following fields and values:

Card Number	4111 11xx xxxx xxxx
First Name	Demo
Surname	Person
Address Line 1	test
Address Line 2	
Town/City	test
Post Code	test
Country	GB

At the bottom of the form, there is a red-bordered button labeled "Edit".

3) Details will now be editable. In order to update any field on this page, you will always need to enter your full card number and CVV for verification purposes. Modify the required entries and click 'Submit'.

The screenshot shows a web interface for managing billing information. At the top, there's a dark header with a menu icon and the text "/ BILLING_INFORM...". Below this, there's a blue bar labeled "BILLING_INFORMATION". Underneath, there's a profile icon and the name "Buildings". The main section is titled "BILLING_INFORMATION" in a blue bar. Below this, there's a form with the following fields and values:

In order to change your billing details or even simply update any field on this page, you will always need to enter your full card number and CVV for verification purposes. We do not hold your card details for security reasons.

Card Number	4111 11xx xxxx xxxx
CVV	123
Expiration Date	10/2019
First Name (as it appears on card)	Firstname
Last Name (as it appears on card)	Lastname
Address Line 1	
Address Line 2	
Town/City	
Post Code	
Country	United Kingdom ▼

At the bottom of the form, there is a red-bordered button labeled "Submit" and a blue-bordered button labeled "Cancel".

How to search for a building

The Home page contains a scrollable list of buildings already uploaded under the heading 'Buildings Listing'. This list also contains the demo building, which is provided free of charge in order for consultants to familiarise themselves with the software. At the top of this section there is a search box which can be used to search for a building by name:

INSTRUCTIONS

1) Type your search term in the search bar under 'Buildings Listing'.

We would recommend you search using the Unique Property Reference Number (UPRN) which can be found on the building's EPC and is used by Landmark¹ or the Scottish EPC Register² to identify unique buildings. If you do not know the UPRN then you can search by address information, such as the building name, street name, city etc. Postcodes may vary between the official registers and your records so we would not recommend using this as your primary search term.

2) Once you have typed your search term, hit the Enter key on your keyboard to trigger the search. You will be presented with the search results in a table.

BUILDINGS LISTING					
<input type="text" value="London"/>					
UPRN	PROPERTY REF	NAME	ADDRESS	LOCATION	POSTCODE
0	999999 - Yet to be defined	Example building	56 London Road	LONDON	SW23 1HA
999999920046	999999 - Yet to be defined	Shopping centre unit	Joe's Clothes Northern Hope Shopping Centre	London	FS1 3AS

¹ Landmark is the official Domestic and Non-domestic EPC register in England and Wales.

² The Scottish EPC Register is operated by the Energy Saving Trust and is the official Domestic and Non-domestic EPC register in Scotland.

How to upload a building

Buildings can be uploaded on the Home page under UPLOAD NEW BUILDING.

INSTRUCTIONS

1) Valid card details must be entered in order to upload models, in order to check or amend billing information see the 'HOW TO MODIFY YOUR USER DETAILS AND BILLING DETAILS' section of this guide.

2) Click on the 'Choose Files' button to select the relevant building file to upload.

UPLOAD NEW BUILDING

Please select an **.inp** file ([click here if you need help regarding the file format](#)). After upload, the system will do the rest. The SBEM input file will be processed and a new building entity and file repository will be created. Note that the complexity of the model has direct impact on upload time.

Choose Files

No file chosen

☐ Replace UPRN☐ Simple upload

Do you have a **coupon code**? Enter it here:

Below are the Discounted Payback Period's **discount rate** and **fuel prices** considered for this building. If you want to change any of these, please do it now.

Discount rate for Building's payback calculation

☐ Remember discount rate and fuel prices for future uploads (**this will update the default values**)

Natural Gas	LPG	Biogas	Oil	Coal	Anthracite	Smokeless Fuel (inc Coke)	Biomass	Dual Fuel Appliances (Mineral + Wood)	Grid Supplied Electricity	Grid Displaced Electricity	Waste Heat	District Heating
0.034	0.0	0.0	0.042	0.0	0.0	0.0	0.0	0.0	0.115	0.0	0.0	0.0

3) Select the model file from your computer or network and click on 'Open'. (The file to be uploaded is the inp file without an underscore in its name and created from the software which is used to produce the epc. This is usually stored in a subfolder within the project directory. This directory is different for each software and is sometimes opened by the software after producing the epc. (please note that if you have renamed the file then this may be more difficult to locate and you should keep note of this). A correct inp file example is show below:

NCM > iSBEM_v5.3.a > Projects > Tutorial building

Search Tutorial building

Name	Date modified	Type	Size
<input type="checkbox"/> Tutorial building_epc.err	21/03/2017 16:03	ERR File	1 KB
<input type="checkbox"/> Tutorial building_not.err	21/03/2017 16:03	ERR File	2 KB
<input type="checkbox"/> Tutorial building_ref.err	21/03/2017 16:03	ERR File	5 KB
<input type="checkbox"/> Tutorial building_sim.hws	21/03/2017 16:03	HWS File	2 KB
<input checked="" type="checkbox"/> Tutorial building.inp	21/03/2017 16:03	INP File	73 KB
<input checked="" type="checkbox"/> Tutorial building_brukl.inp	21/03/2017 16:03	INP File	15 KB
<input checked="" type="checkbox"/> Tutorial building_epc.inp	21/03/2017 16:03	INP File	19 KB
<input checked="" type="checkbox"/> Tutorial building_not.inp	21/03/2017 16:03	INP File	136 KB
<input checked="" type="checkbox"/> Tutorial building_ref.inp	21/03/2017 16:03	INP File	133 KB
<input checked="" type="checkbox"/> Tutorial building_dr.csv	21/03/2017 16:03	Microsoft Excel C...	78 KB
<input checked="" type="checkbox"/> Tutorial building_epc.csv	21/03/2017 16:03	Microsoft Excel C...	5 KB
<input checked="" type="checkbox"/> Tutorial building_not_dr.csv	21/03/2017 16:03	Microsoft Excel C...	85 KB
<input checked="" type="checkbox"/> Tutorial building_not_sim.csv	21/03/2017 16:03	Microsoft Excel C...	10 KB
<input checked="" type="checkbox"/> Tutorial building_ref_sim.csv	21/03/2017 16:03	Microsoft Excel C...	10 KB
<input checked="" type="checkbox"/> Tutorial building_sim.csv	21/03/2017 16:03	Microsoft Excel C...	8 KB
<input type="checkbox"/> Tutorial building.nct	22/03/2017 09:17	NCT File	1,744 KB
<input type="checkbox"/> Tutorial building_sim.ovh	21/03/2017 16:03	OVH File	2 KB

4) Set the discount rate and fuel prices (in GB pounds per kWh) to be used for the Discounted Payback Period calculation.

There is an optional checkbox to replace a building if its Unique Property Reference Number (UPRN) already exists, for example if there is an earlier building model uploaded.

5) Once this information is entered, click the 'Upload file' button.

6) Pricing information will be displayed after the Upload file button is clicked. In order to continue with the upload, tick the checkbox and then click the 'Continue Upload' button. The transaction will only be authorised and therefore charged after the building is processed by the platform, if the building cannot be processed due to model errors (or for any other reason) the payment will not be authorised and payment will not be taken.

This model upload costs £350

If you agree, we will upload your model and after it has been processed by our servers, your credit card is going to be charged. Do you agree?

☐ I agree with being charged £350 for this model upload.

Continue Upload **Cancel**

How to create building groups

Building Groups can be created by the user; these will then be listed under 'User Groups'. This enables buildings to be sorted into Building Groups for convenience. As well as 'User Groups', the software also contains 'Default Groups', these contain the 'Demo Buildings' Group containing the demo building, which is provided free of charge in order for consultants to familiarise themselves with the software.

INSTRUCTIONS

1) To create a new Building Group, enter a name and Description under 'Create New Group' and click the 'Create' button.

USER GROUPS

NAME AND DESCRIPTION	No OF ASSETS	
new group a group	0	...
Offices Office buildings	1	...
Retail Retail buildings	1	...

CREATE NEW GROUP

Name

Description

Create

Please pick a name for your group and write a brief description to identify its purpose.




2) The new Building Group will then appear under 'User Groups'. In order to add buildings to this new group see the 'HOW TO ORGANISE BUILDINGS INTO BUILDING GROUPS' section of this guide.

How to organise buildings into building groups

Once created, User Groups can be edited, deleted or viewed using the buttons to the right of the group name.

INSTRUCTIONS

1) To add a building to a Building Group, click on the Edit User group button, to the right of the relevant User Group. This will take you to the Edit Group page. Here you can change the name and description of the group and also add and remove buildings from the group.

USER GROUPS		
NAME AND DESCRIPTION	No OF ASSETS	
new group a group	0	...
Offices Office buildings	1	<div><div>Edit</div><div>...</div><div></div><div></div><div></div></div>
Retail Retail buildings	1	

2) Search for the building you wish to add using the search box under the 'Add Assets' button (see the HOW TO SEARCH FOR A BUILDING section of this guide for further guidance).

/ GROUPS / OFFICES / EDIT

Name

Offices

Description

Office buildings

UPDATE

Please pick a name for your group and write a brief description to identify its purpose.

ASSETS IN YOUR GROUP

Search for building

Click over an asset to exclude it from your group - Don't worry, you can add it again later

ADD ASSETS

London

Click over an asset to add it to your group

999999920046

999999 - Yet to be defined

Shopping centre unit

Joe's Clothes
Northern Hope Shopping Centre

London

FS1 3AS

6

3) Simply click a building entry to add it to your Building Group. A building can only be a member of one Building Group at any time.

4) Buildings can similarly be removed from a Group by searching for the building under 'Assets in your Fund' and clicking a building entry to remove it.

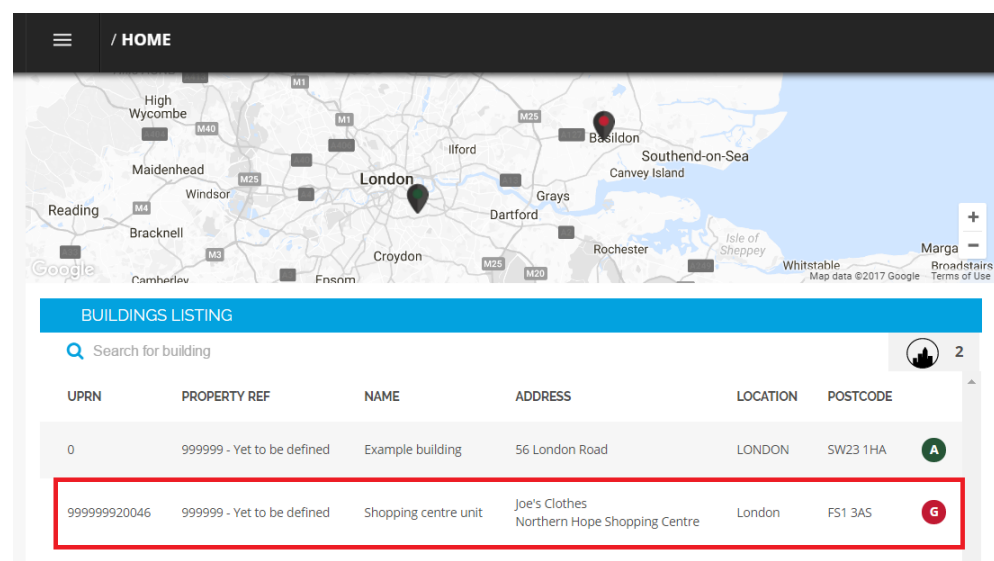
How to view a building's modelled performance data and EPC rating

arbn consult allows you to visualise the contents of a building's energy model³ in graphical and tabular format on the Asset View page. This page also allows you to download the building energy model.

INSTRUCTIONS

1) Navigate to the Home page and search for your building (see the HOW TO SEARCH FOR A BUILDING section of this guide)

2) Locate your building in the search results. Hover over the table row and click on it. You will see a pop-up window.



The screenshot shows the 'HOME' page of the arbn consult application. At the top is a navigation bar with a menu icon and the text '/ HOME'. Below this is a map of London with several location pins. A 'BUILDINGS LISTING' section is visible, featuring a search bar and a table with the following columns: UPRN, PROPERTY REF, NAME, ADDRESS, LOCATION, and POSTCODE. The table contains two entries. The first entry is 'Example building' at '56 London Road', 'LONDON', 'SW23 1HA', with a green 'A' icon. The second entry is 'Shopping centre unit' at 'Joe's Clothes Northern Hope Shopping Centre', 'London', 'FS1 3AS', with a red 'G' icon. This second entry is highlighted with a red border.

UPRN	PROPERTY REF	NAME	ADDRESS	LOCATION	POSTCODE
0	999999 - Yet to be defined	Example building	56 London Road	LONDON	SW23 1HA
999999920046	999999 - Yet to be defined	Shopping centre unit	Joe's Clothes Northern Hope Shopping Centre	London	FS1 3AS

³ A building energy model provides a physics based calculation of a building's theoretical energy consumption. It can be used as a tool for many different purposes, including the production of an EPC or appraisal of the effect of energy efficiency improvement options.

3) Navigate to the View Asset page. The pop-up window will provide you with key details about the building, including address information and the EPC rating.

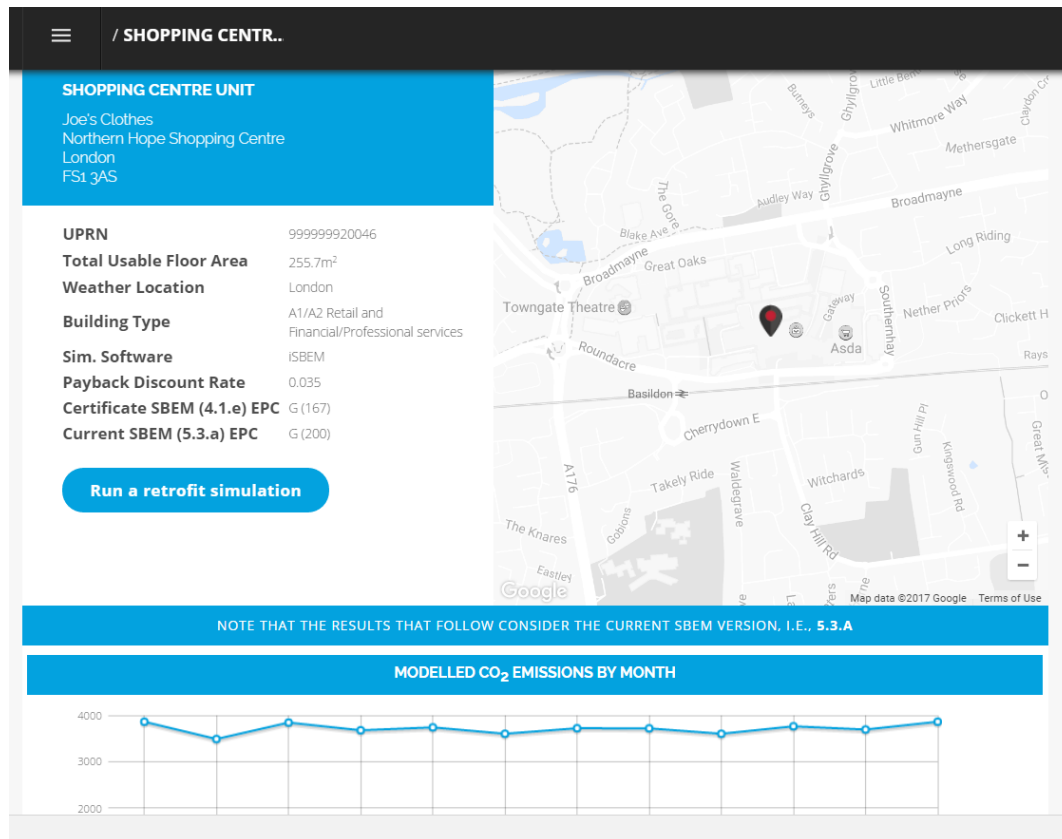
To view more detailed data about the building and to access the energy model, you need to click on the View Asset button at the bottom of the pop-up window to navigate to the View Asset page.

The screenshot shows a web application interface with a dark header bar containing a menu icon and the text "/ HOME". A map of a residential area is visible in the background. A white pop-up window is overlaid on the map, displaying building information for a "SHOPPING CENTRE UNIT". The window has a blue header with the unit name and address. Below this, a table lists various attributes and their values. At the bottom of the window, there are three icons: a building icon (highlighted with a red box), a document icon, and a book icon. The building icon is labeled "View Asset".

SHOPPING CENTRE UNIT	
Joe's Clothes Northern Hope Shopping Centre London FS1 3AS	
UPRN	999999920046
Total Usable Floor Area	255.7m ²
Weather Location	London
Building Type	A1/A2 Retail and Financial/Professional services
Sim. Software	ISBEM
Payback Discount Rate	0.035
Certificate SBEM (4.1.e) EPC	G (167)
Current SBEM (5.3.a) EPC	G (200)

View Asset Asset Energy Report Simulations

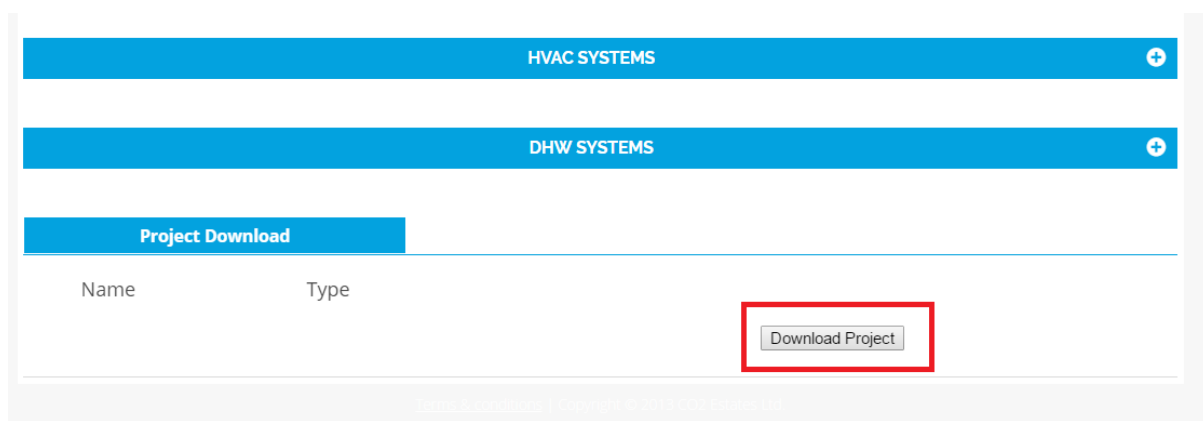
4) View modelled performance data for the building and building zone information. Scroll to view all graphs and tables. The graphs are interactive so you can hover and click on them to reveal additional data.



Building zone information can be reviewed to view zone area, lighting type and heating and domestic hot water system assigned to each zone. Details of constructions, glazing, HVAC and DHW parameters are also viewable under the relevant drop down headings.

FULL BUILDING ZONE INFORMATION					
SBEM	Zone	Lighting	Heating System	DHW Generator	Area m ²
1067	Circulation area (corridors and stairways) - non public	T8 Fluorescent - halophosphate - low frequency ballast	No Heating or Cooling	SAW	36.55
1071	Small Shop Unit Sales area - general	Tungsten or Halogen	Split or multi-split system	SAW	119.37
1077	Toilet	T8 Fluorescent - halophosphate - low frequency ballast	Other local room heater - unfanned	SAW	30.0
1074	Store Room	T8 Fluorescent - halophosphate - low frequency ballast	Other local room heater - unfanned	SAW	20.8
		T8 Fluorescent - halophosphate	Other local room heater		

5) It is also possible to download Building files. To do this scroll to the bottom of the View Asset page to see the files available for download under the Project Download banner. If no files are listed, the building's .inp file will still be available for download. Click on the Download button to the right hand side of each file to download them to your computer. If you would like to download all files for the building at once, then click on the Download Project button. This will trigger a download of a zip file to your computer, containing all files shown for the building plus the building .inp file.



How to improve a building's EPC rating

arbn consult has a simulation engine that allows you to simulate what would happen to a building's performance (including the EPC rating) if you were to install particular energy efficiency improvement measures, such as lighting upgrades or boiler replacements.

You can run simulations yourself through arbn consult's Simulation page or you can see what arbn consult automatically suggests for your building on the MEES Asset Energy Report (AER) page or Investment Asset Energy Report (AER) page.

INSTRUCTIONS

We would recommend that you follow the below workflow when arriving at a strategy for improving the EPC rating of your building.

1) Understand the building's current performance, and key causes of energy inefficiencies (see HOW TO VIEW A BUILDING'S MODELLED PERFORMANCE DATA AND EPC RATING section of this guide)

2) Look at what arbn consult has automatically suggested for the building in the AER to act as a guide for your decision-making (see below instructions to navigate to the AER page)

3) Select a bespoke package of recommendations and view the results (see below instructions to navigate to the Simulation page).

There will be some scenarios where it is very difficult to improve a building's EPC rating to the desired level. In these cases, please contact arbn consult customer support to speak with one of our engineers about further analysis options.

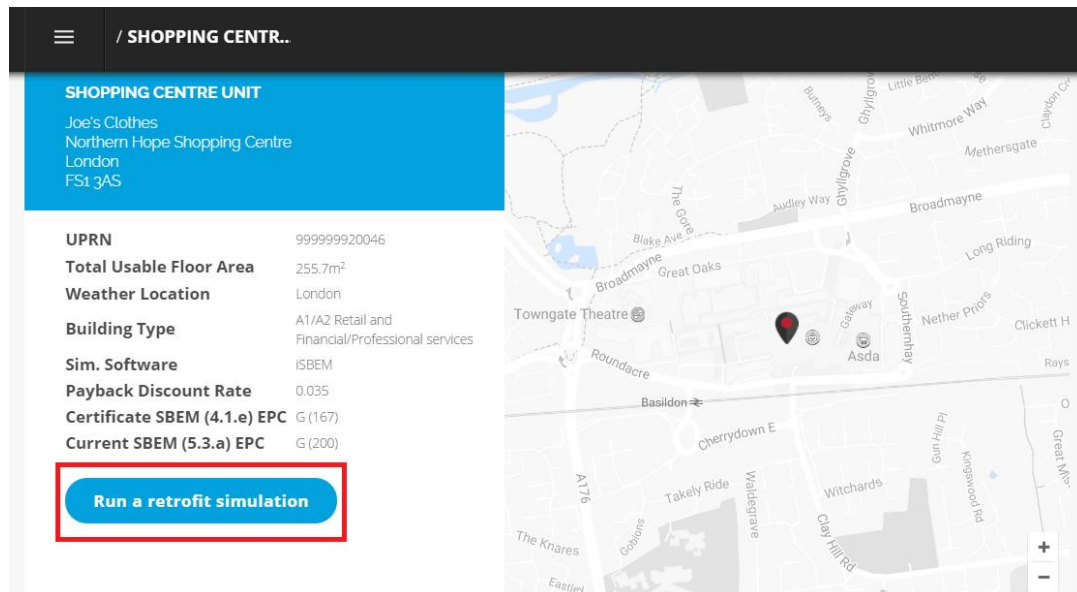
How to navigate to the building's simulation page

There are two ways of navigating to a building's Simulation page.

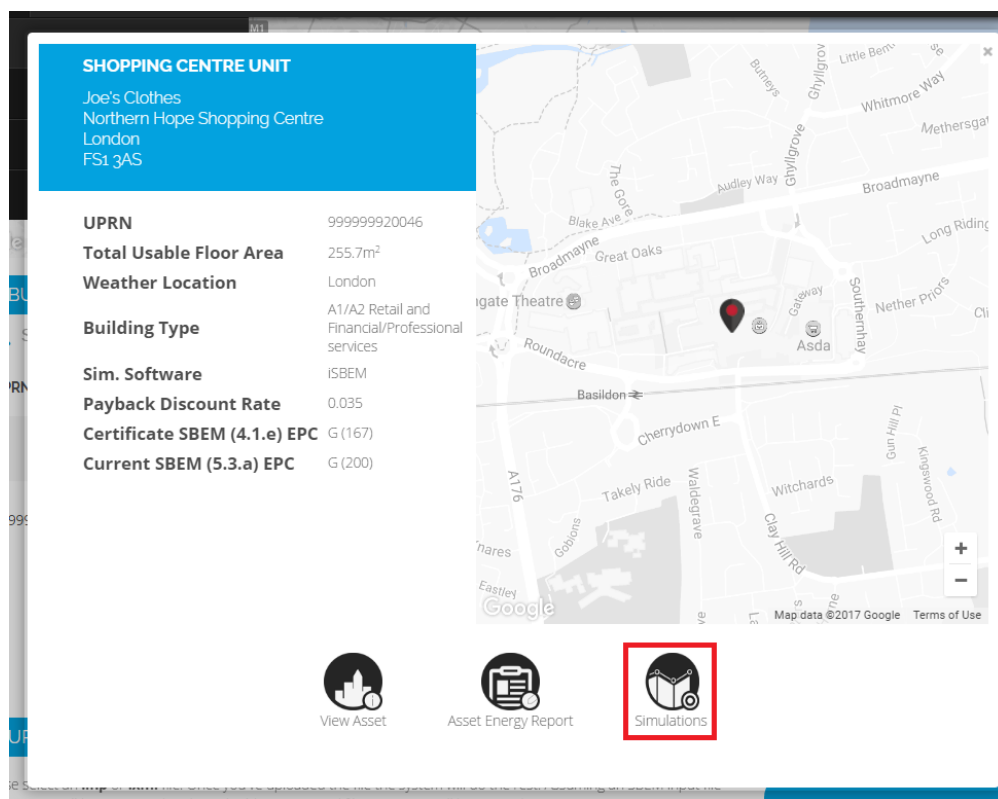
INSTRUCTIONS

1) Search for a building through the Building Search page and navigate to the View Asset page via the pop-up window (see the HOW TO SEARCH FOR A BUILDING section of this guide).

2) On the View Asset page, there is a button called Run a retrofit simulation. Click on this button to go to the building's Simulation page.



3) Alternatively, you can skip straight to the Simulation page via the building pop-up window accessed via the Building Search page, which will take you straight to that particular building's Simulation page.



How to run a retrofit recommendation simulation and view the results

On the Simulation page, you can select individual or multiple recommendations from the recommendations table and view the predicted impact these would have upon the building.

INSTRUCTIONS

1) Navigate to the building's simulation page (see the HOW TO NAVIGATE TO THE BUILDING'S SIMULATION PAGE section of this guide)

2) Check the box to the left hand side of a recommendation to select it.

Select a single recommendation or build a package of recommendations and click "Request Simulation"									
Request Simulation									
Category	Recommendation	Affected area	Cost	Savings	Discounted Payback period (yrs)	Saved kgCO ₂ /m ²	Rating	MEES Exempt?	
<input type="checkbox"/>	Lighting	Replace T8 fluorescent tubes with T5 fluorescent tubes (lamp and luminaire)	136m ²	£552 to £718	£390	1.5 to 1.9	6.58	G 193	✗
<input type="checkbox"/>	Lighting	Replace T8 fluorescent tubes with LEDs (lamp)	136m ²	£503 to £654	£328	1.6 to 2.1	5.55	G 194	✗
<input type="checkbox"/>	Lighting	Replace tungsten lamps with LEDs (lamp and luminaire)	119m ²	£7,878 to £10,242	£6,862	1.2 to 1.6	121	C 64	✗
<input type="checkbox"/>	Lighting	Replace T8 fluorescent tubes with T5 fluorescent tubes (lamp)	136m ²	£552 to £718	£270	2.2 to 2.8	4.58	G 195	✗
<input type="checkbox"/>	Lighting	Replace tungsten lamps with LEDs (lamp)	119m ²	£2,036 to £2,648	£6,263	0.3 to 0.4	111	D 76	✗
<input type="checkbox"/>	Lighting	Install lighting controls	136m ²	£409 to £532	£30.0	18.8 to 28.1	0.52	G 200	✓
<input type="checkbox"/>	HVAC	Replace existing local electric heating and/or air source heat pump with a new air source heat pump system	158m ²	£7,278 to £9,461	£199	N.A.	3.52	G 196	✓
<input type="checkbox"/>	HVAC	Replace boiler with high efficiency type	34.9m ²	£142 to £184	£16.0	10.6 to 14.7	0.40	G 200	✓
<input type="checkbox"/>	Misc	Replace local electric heating system(s) with gas fired, wet radiator system	64.9m ²	£3,980 to £5,174	£254	23.1 to 36.2	3.62	G 196	✓

You might notice that some of the recommendations are removed from the table when you select a recommendation; this is to prevent you from selecting incompatible recommendations. All recommendations will reappear when you unselect an incompatible recommendation.

If the recommendation or package of recommendations you have selected has been simulated before then you will see a button above the recommendations table labelled 'View Results'. Click on this to instantaneously view the results of your selected recommendation(s).

The results of this simulation are available to view immediately, click "View Results"									
View Results									
Category	Recommendation	Affected area	Cost	Savings	Discounted Payback period (yrs)	Saved kgCO ₂ /m ²	Rating	MEEs Exempt?	
<input checked="" type="checkbox"/> Lighting	Replace T8 fluorescent tubes with LEDs (lamp)	136m ²	£503 to £654	£328	1.6 to 2.1	5.55	G 194	✗	
<input type="checkbox"/> Lighting	Replace tungsten lamps with LEDs (lamp and luminaire)	119m ²	£7,878 to £10,242	£6,862	1.2 to 1.6	121	C 64	✗	
<input type="checkbox"/> Lighting	Replace tungsten lamps with LEDs (lamp)	119m ²	£2,036 to £2,648	£6,263	0.3 to 0.4	111	D 76	✗	
<input type="checkbox"/> Lighting	Install lighting controls	136m ²	£409 to £532	£30.0	18.8 to 28.1	0.52	G 200	✓	
<input type="checkbox"/> HVAC	Replace existing local electric heating and/or air source heat pump with a new air source heat pump system	158m ²	£7,278 to £9,461	£199	N.A.	3.52	G 196	✓	
<input type="checkbox"/> HVAC	Replace boiler with high efficiency type	34.9m ²	£142 to £184	£16.0	10.6 to 14.7	0.40	G 200	✓	
<input type="checkbox"/> Misc	Replace local electric heating system(s) with gas fired, wet radiator system	64.9m ²	£3,980 to £5,174	£254	23.1 to 36.2	3.62	G 196	✓	

3) If the recommendation(s) you have selected has NOT been simulated before then you will see a button above the recommendations table labelled 'Request Simulation'. Click on this to request simulation of your selected recommendation(s) by the arbn consult simulation engine.

arbn consult will then commence your simulations and will alert you once they are ready to view. This may take a few seconds to a few minutes depending upon the number of recommendations chosen and the complexity of the building.

<p>This is the first time this simulation package has been selected, arbn consult will take a few minutes to run this simulation and will notify you via your alerts when the results are ready to view. Click "Request Simulation" to start the simulation.</p>								
<div>Request Simulation</div>								
Category	Recommendation	Affected area	Cost	Savings	Discounted Payback period (yrs)	Saved kgCO ₂ /m ²	Rating	MEES Exempt?
<input checked="" type="checkbox"/> Lighting	Replace T8 fluorescent tubes with LEDs (lamp)	136m ²	£503 to £654	£328	1.6 to 2.1	5.55	G 194	✕
<input checked="" type="checkbox"/> Lighting	Replace tungsten lamps with LEDs (lamp)	119m ²	£2,036 to £2,648	£6,263	0.3 to 0.4	111	D 76	✕
<input type="checkbox"/> Lighting	Install lighting controls	136m ²	£409 to £532	£30.0	18.8 to 28.1	0.52	G 200	✓
<input type="checkbox"/> HVAC	Replace existing local electric heating and/or air source heat pump with a new air source heat pump system	158m ²	£7,278 to £9,461	£199	N.A.	3.52	G 196	✓
<input type="checkbox"/> HVAC	Replace boiler with high efficiency type	34.9m ²	£142 to £184	£16.0	10.6 to 14.7	0.40	G 200	✓
<input type="checkbox"/> Misc	Replace local electric heating system(s) with gas fired, wet radiator system	64.9m ²	£3,980 to £5,174	£254	23.1 to 36.2	3.62	G 196	✓

4) Once ready to view, you will see an orange circle on the top menu button.

SHOPPING CENTRE UNIT
Joe's Clothes
Northern Hope Shopping Centre
London
FS1 3AS

UPRN	999999920046
Total Usable Floor Area	255.7m ²
Weather Location	London
Building Type	A1/A2 Retail and Financial/Professional services
Sim. Software	ISBEM
Payback Discount Rate	0.035
Certificate SBEM (4.1.e) EPC	G (167)
Current SBEM (5.3.a) EPC	G (200)

[View Asset Energy Report](#)

Request simulation page: > .pdf > .docx

<input type="checkbox"/> Misc	Replace local electric heating system(s) with gas fired, wet radiator system	64.9m ²	£3,980 to £5,174	£254	23.1 to 36.2	3.62	G 196	✓
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5) Open the top menu and click on the Alerts button. Here you will be shown your alerts for completed simulations, and you can view the results by clicking on 'View'. You can also dismiss the alert by clicking on Dismiss notification.

ALERTS 1

Message: Simulation request for: Shopping centre unit - 999999920046 sent. You will be notified once it has been processed.

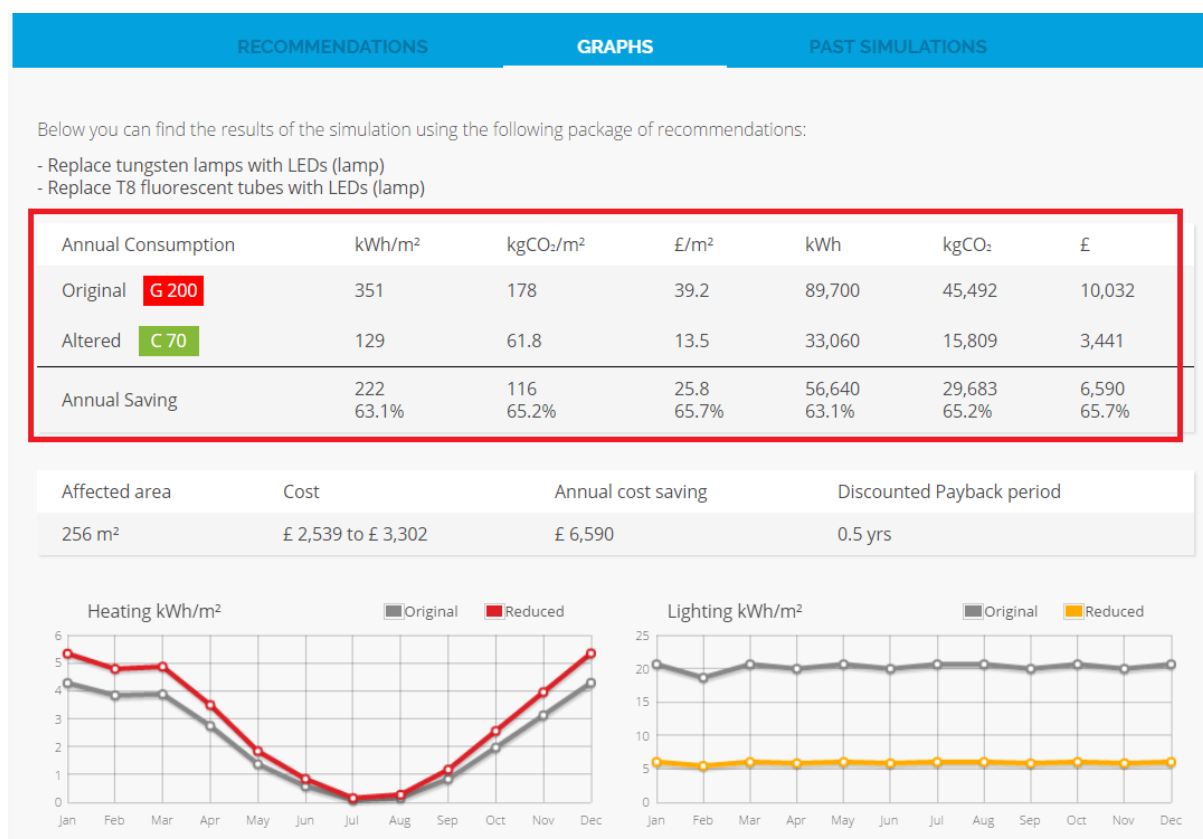
Response: Simulation processed successfully

[View](#) **new**

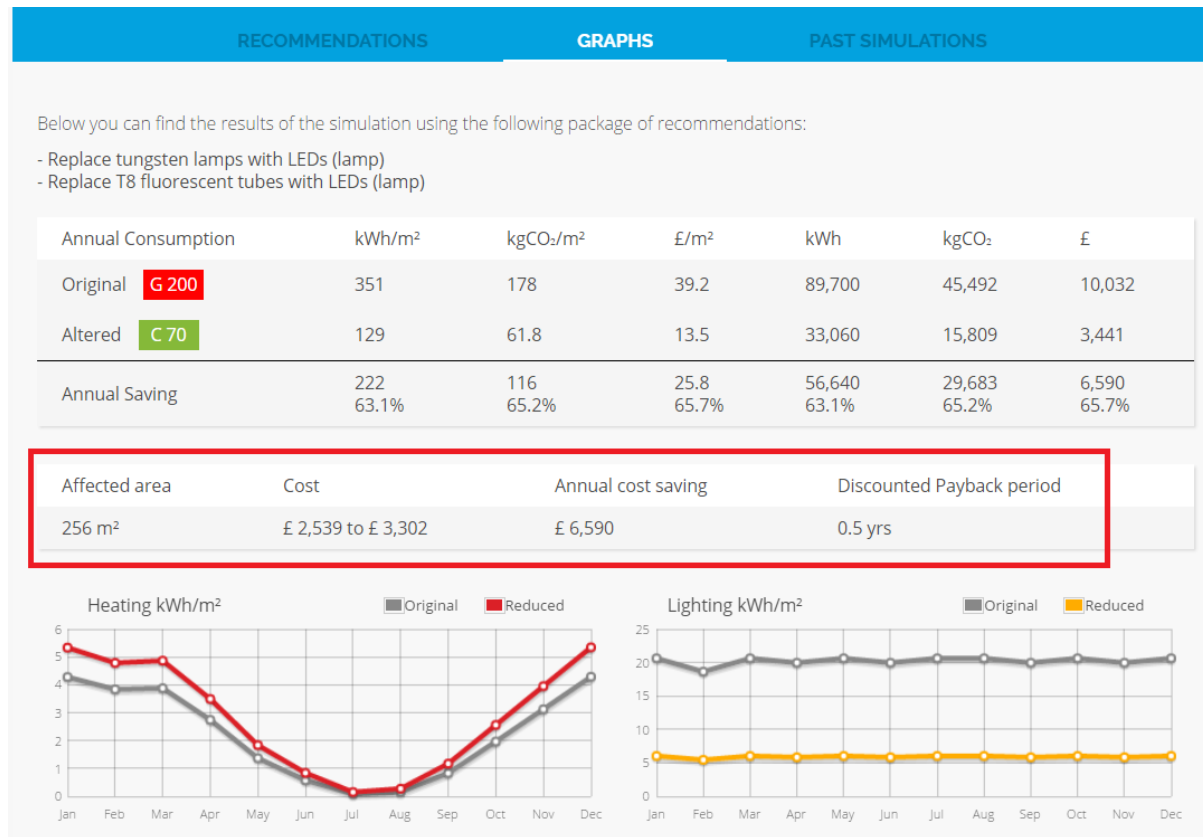
[Dismiss notification](#)

Whether results are viewed instantaneously via the 'View Results' button or after a few minutes for a new simulation, you will be shown the results of your selection on the Graphs tab on the Simulation page.

On the Graphs tab, you will see two tables. The top table shows you the predicted impact of the selected recommendation(s) upon your building's modelled energy, carbon and energy cost performance. This includes the impact upon the EPC rating.

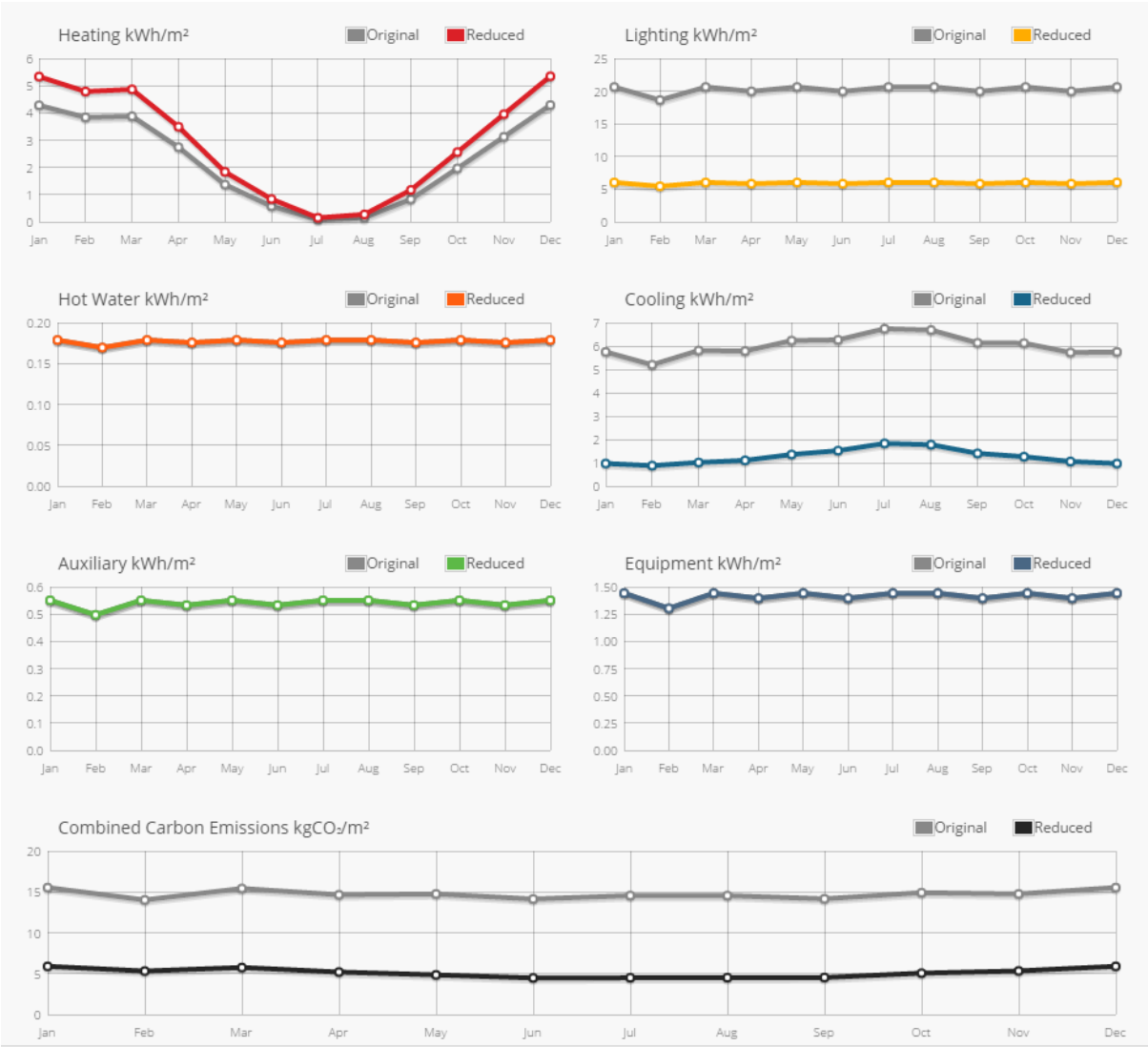


The bottom table shows you the affected area in m² of the retrofit recommendations, the indicative cost⁴ to carry out the works, the estimated energy cost saving, and estimated discounted payback period in years.



⁴ This cost has been calculated by arbn consult using cost methods prepared by the arbnco development and engineering team. The cost rates referenced by these methods have been sourced from recognised industry price books or manufacturers. These costs are indicative and exclusions are stated on the Simulation page via the Exclusions button for each recommendation.

Below the tables are line graphs showing the original and new consumption values for each consumer in the building, as well as the overall carbon dioxide emissions.



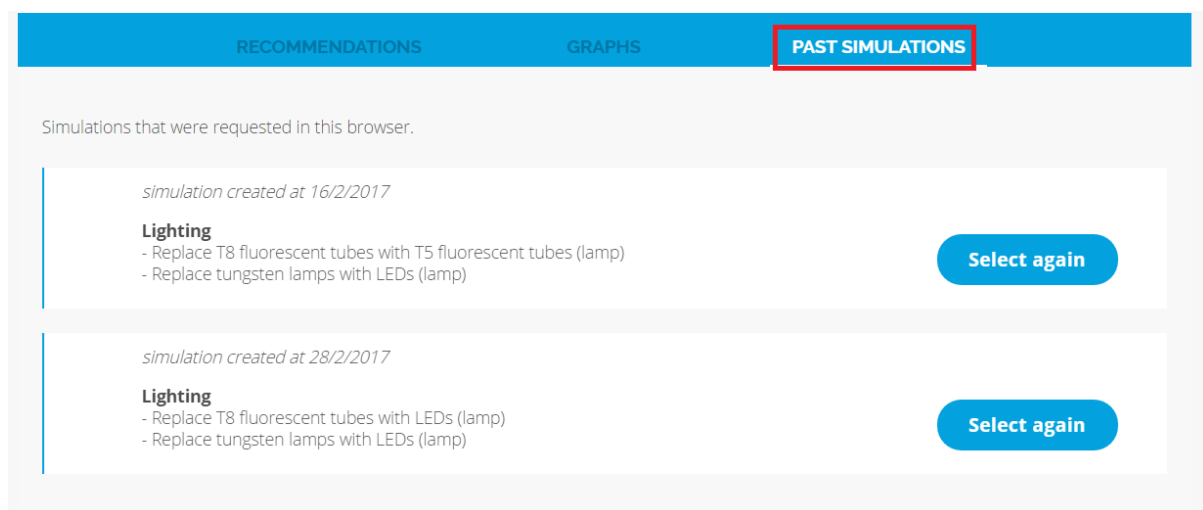
How to view and export results of past simulations

The Past Simulations tab allows you to view recommendation packages that you previously simulated using arbn consult. This provides you with a shortcut if you want to review the results again. It also allows you to export results to pdf and MS Word formats for the package of recommendations selected.

INSTRUCTIONS

1) Navigate to the building's simulation page (see the HOW TO NAVIGATE TO THE BUILDING'S SIMULATION PAGE section of this guide)

2) Go to the Past Simulations tab



3) Click on the 'Select again' button next to your selected package of measures and then click on 'View Results'.

4) To export results to pdf format click on '> pdf' next to 'Request simulation page' directly below the 'View Asset Energy Report' button.

The screenshot shows a web interface for a simulation tool. The top navigation bar includes a menu icon and the path '/ SHOPPING CENTR... / SIMULATION'. The main content area is divided into two sections. On the left, a blue header 'SHOPPING CENTRE UNIT' is followed by details: 'Joe's Clothes', 'Northern Hope Shopping Centre', 'London', and 'FS1 3AS'. Below this is a table of building characteristics:

UPRN	999999920046
Total Usable Floor Area	255.7m ²
Weather Location	London
Building Type	A1/A2 Retail and Financial/Professional services
Sim. Software	iSBEM
Payback Discount Rate	0.035
Certificate SBEM (4.1.e) EPC	G (167)
Current SBEM (5.3.a) EPC	G (200)

Below the table is a blue button labeled 'View Asset Energy Report'. Underneath this button, a red box highlights the text 'Request simulation page: > .pdf > .docx'. On the right side of the interface is a map showing the location of the building, with a red pin marking the site. The map includes street names like Broadmayne, Great Oaks, and Cherrydown E.

5) To export results to MS Word format click on '> docx' next to 'Request simulation page' directly below the 'View Asset Energy Report' button.

How to access a building's MEES asset energy report (aer)

The MEES AER is an automated report that arbn consult generates for each building.

The report presents three optimal retrofit strategies for the building. These strategies have been automatically selected by arbn consult's simulation engine as part of a MEES decision making process:

- Maximised EPC Assessor maximised EPC rating: This strategy seeks the best possible EPC rating.

- Maximised EPC rating: This strategy seeks the best possible EPC rating using where appropriate additional recommendations not identified by the energy assessor
- Achieve D or better: This strategy seeks to achieve a D rated EPC. Depending upon the building being assessed, it is possible that this rating may not be achieved or that better ratings may be presented within the report.
- Achieve E or better: This strategy seeks to achieve an E rated EPC. Depending upon the building being assessed, it is possible that this rating may not be achieved or that better ratings may be presented within the report.

In the event that no strategy meets the above criteria, then the best alternative will be presented by the software. In some cases, this may not produce retrofit recommendations that have a large impact upon the EPC rating.

INSTRUCTIONS

1) Navigate to the building's Simulation page (See the HOW TO NAVIGATE TO THE BUILDING'S SIMULATION PAGE section of this guide)

2) Open the MEES Asset Energy Report (AER)

You will see a button below the building's address information on the Simulation page labelled 'View Asset Energy Report'. Click on this button to open the MEES AER on a new tab in your browser.

Summary

Allows you to view the building address, UPRN, floor area and other basic building information as well as the current building Asset Rating. Note that two EPC Asset ratings are shown here – the rating as shown on the current building EPC certificate and the Asset Rating which would be achieved using the latest version of SBEM. The latter of these is used as a baseline when running recommendations and retrofit strategies to enable the effect of recommendations to be assessed fairly.

Retrofit Strategies

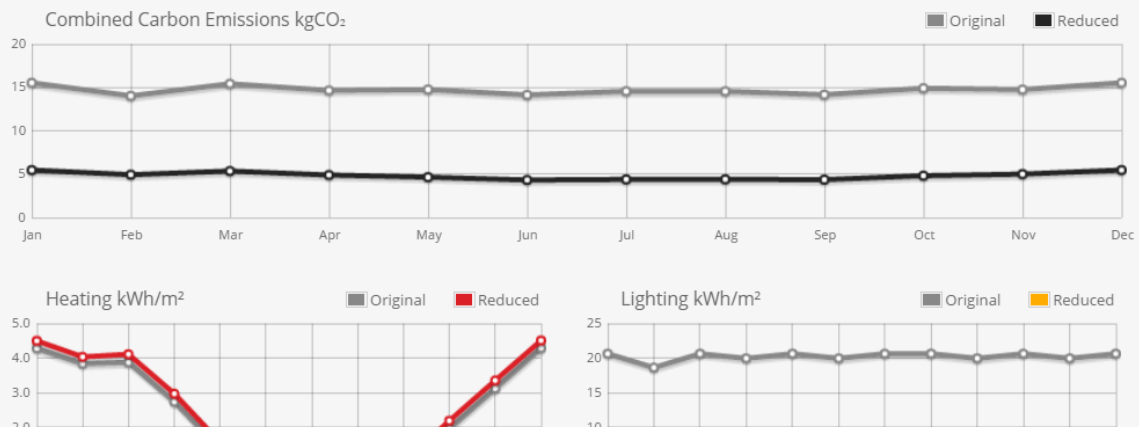
This section presents options for retrofit strategies for this property. These strategies have been automatically selected by arbn consult's simulation engine. The number of strategies presented here varies according to the building model and how it responds to the relevant recommendations. If some strategies are not presented, it simply means that they did not achieve the intended results and are hereby omitted. For each of the retrofit strategies the individual retrofit recommendation(s) included are listed along with their cost range and affected area. For the strategy as a whole, the associated indicative capital cost range, the estimated discounted payback period in years, and the impact upon the EPC rating is shown. The related impact upon the carbon emissions and energy consumers is also shown graphically.

Recommendation name	lower cost	upper cost	affected area
Install lighting controls	£408.99	£531.69	136.33m ²
Replace tungsten lamps with LEDs (lamp)	£2035.86	£2648.22	119.37m ²
Replace existing local electric heating and/or air source heat pump with a new air source heat pump system	£7277.66	£9460.96	158.21m ²
Replace T8 fluorescent tubes with T5 fluorescent tubes (lamp and luminaire)	£552.46	£718.19	136.33m ²
Replace boiler with high efficiency type	£141.51	£183.97	34.89m ²

Cost (£): 10,416 to 13,543

Discounted Payback Period (yrs): 1.6 to 2.1

G 200 → C 66



Retrofit Recommendations

This section of the report allows you to view all of the applicable retrofit recommendations and their individual impact upon the modelled energy performance of your building.

Please note, those recommendations with '7-Year Energy Savings' highlighted in green meet the MEES 7-year payback and those in red do not.

Replace T8 fluorescent tubes with T5 fluorescent tubes (lamp and luminaire)	EPC-L5	Affected Area (m ²)
Cost exclusion: Systemic upgrades		136.33
		Impact on EPC Rating
		G 200 → G 193
		Inconvenience Indicator
		Medium
		Cost
		£ 552 to £ 718
		Discounted Payback Period
		1.5 to 1.9 yrs
		MEES
		Repayment Cost
		£ 648
		7-Year Energy Savings
		£ 2,731
		Exemption Status
		NOT EXEMPT
Replace existing local electric heating and/or air source heat pump with a new air source heat pump system	EPC-R5	Affected Area (m ²)
Cost exclusion: Systemic upgrades		158.21
		Impact on EPC Rating
		G 200 → G 196
		Inconvenience Indicator

The appropriate retrofit recommendations are presented for the property. The recommendation is presented, along with the:

- Affected area associated with the works
- Impact upon the EPC rating if the recommendation were to be implemented
- Indicator of the level of inconvenience associated with the recommendation, essentially how intrusive the works would be, using red, amber or green to signify high, medium or low inconvenience respectively
- Estimated cost for undertaking the works
- Estimated payback in years
- Investment Repayment Cost
- Total energy savings in a 7-year period – this is colour-coded with either a red or green band depending upon whether it meets the MEES 7 year payback rule or not.

MEES exemption status (considers if savings in a 7-year period are greater than the investment repayment cost)

Note that the recommendation costs and savings are indicative, they should be used to aid decision making ahead of further feasibility and design. There are some general exclusions associated with the costs, which include: preliminary costs, professional fees, local authority approvals for works and site access, specialist surveys and associated works, overheads and profit, out of hours working/weekend rates, and VAT. It's also assumed that existing structure will be capable of accommodating the load associated with any new installations.

4) View the Investment Asset Energy Report (AER).

As well as the MEES Asset Energy Report the software also produces an Investment Report which does not include reference to the MEES requirements and can be used for standard investment decision making. To view the Investment Report, click on 'Switch report format to Investment Report' at the top of the MEES AER.

The screenshot shows the 'arbnconsult' web interface for a 'MEES Asset Energy Report'. At the top, there are navigation tabs: 'SUMMARY' (highlighted), 'RETROFIT STRATEGIES', and 'RETROFIT RECOMMENDATIONS'. Below the tabs is a black banner with white text: 'NOTE THAT THE RESULTS THAT FOLLOW CONSIDER THE CURRENT SBEM VERSION, I.E., 5.3.A'. The main content area has a header with a building icon, the title 'MEES Asset Energy Report', and three links: '> Switch report format to Investment Report' (highlighted with a red box), '> Request .pdf', and '> Request .docx'. Below this, there is a paragraph explaining that the report is generated by the arbn consult calculation engine and provides an overview of the property's predicted energy use. Another paragraph states that all building zones, lighting, heating systems, and areas have been assessed, and suitable improvement strategies are modelled with anticipated costs, annual energy savings, and payback periods. Below the text, there is a blue box on the left containing the address: 'SHOPPING CENTRE UNIT', 'Joe's Clothes', 'Northern Hope Shopping Centre', 'London', 'FS1 3AS'. To the right of the address box is a map showing the location of the property. At the bottom left, there is a table with two rows: 'UPRN' with value '999999920046' and 'Total Usable Floor Area' with value '255.7m²'.

UPRN	999999920046
Total Usable Floor Area	255.7m²

5) Export Reports to pdf and MS Word formats


To export an AER or Investment Report to pdf format click on 'Request .pdf' at the top of the AER or Investment Report.

To export an AER or Investment Report to MS Word format click on 'Request.docx' at the top of the AER or Investment Report.

SUMMARYRETROFIT STRATEGIESRETROFIT RECOMMENDATIONS

arbnconsult

NOTE THAT THE RESULTS THAT FOLLOW CONSIDER THE CURRENT SBEM VERSION, I.E., 5.3.A

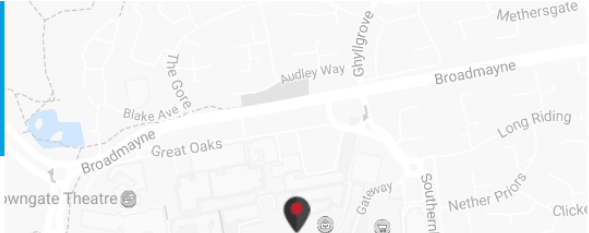
 **MEES Asset Energy Report**

[> Switch report format to Investment Report](#) [> Request .pdf](#) [> Request .docx](#)

This report has been generated by the arbn consult calculation engine. It provides an overview of the property's predicted energy use using information gathered during an on-site survey and subsequent modelling of this information using SBEM (Simplified Building Energy Model).

All building zones designated within the energy model, their associated lighting, heating systems and areas have been assessed and suitable improvement strategies modelled with anticipated costs, annual energy savings and payback periods provided. Payback calculations herein reference both the Discounted Payback Period and demonstrate the ability of each identified improvement to achieve the MEES 7-year payback.

SHOPPING CENTRE UNIT
Joe's Clothes
Northern Hope Shopping Centre
London
E1 3AS



UPRN	999999920046
Total Usable Floor Area	255.7m ²

The document will be sent to your registered e-mail address.

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