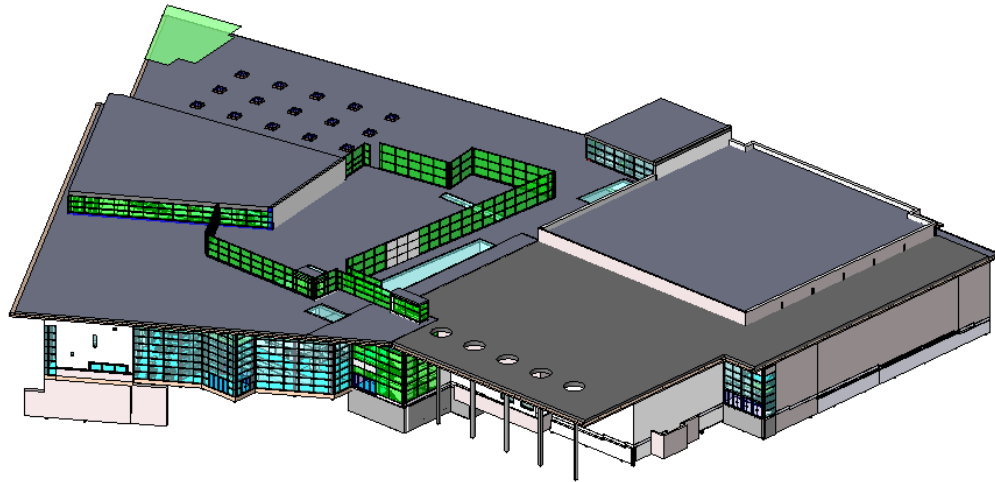
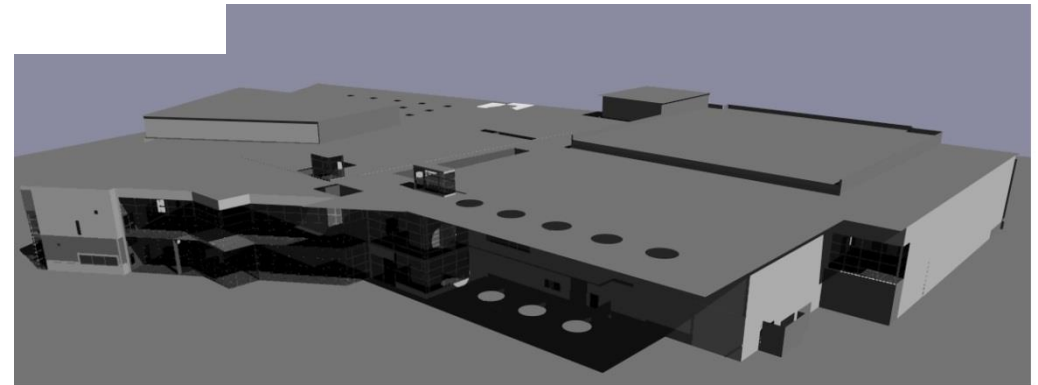


EDSL Tas working in partnership with **cadline**

Bringing Green BIM and Sustainable Design to the construction industry



Revit Architecture 3D Model



EDSL Tas 3D Model



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Developed for use by architects to check the
compliance of architectural designs with
UK Building Regulations Part L2

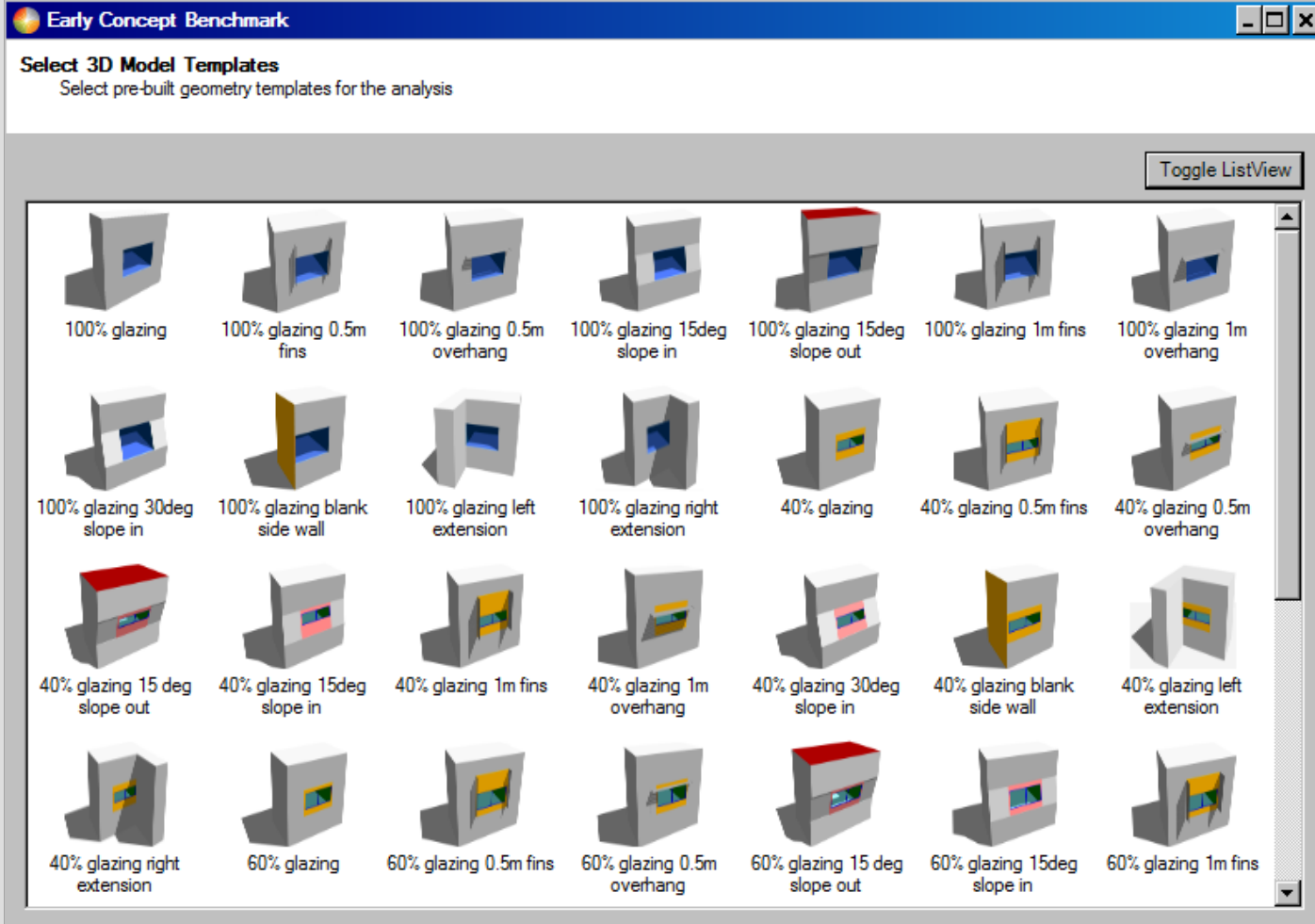
Compliant with UK Part L, CIBSE, ASHRAE and CEN standards

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Initial parametric studies

In its simplest form the tool may be used for early concept parametric studies to develop compliant façade specifications.



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Initial parametric studies

Additional variables include 20 building types

with 10 space types for each building type

This choice installs the appropriate NCM occupation schedules into the façade models

Early Concept Benchmark

Select Activities

Select the NCM Activities to use for the analysis

NCM Activity	
<input checked="" type="checkbox"/>	A1 A2 Retail Financial and Professional Services
<input checked="" type="checkbox"/>	A3 A4 A5 Restaurants and Cafes
<input checked="" type="checkbox"/>	B1 Offices and Workshops
	B1_Changing
	B1_Circulation
	B1_EatDrink
	B1_FoodPrep
	B1_Gym
	B1_Office
	B1_Reception
	B1_Store
	B1_Toilet
	B1_WkshpSS
<input checked="" type="checkbox"/>	C1 Hotels
<input checked="" type="checkbox"/>	C2 Residential Schools
<input checked="" type="checkbox"/>	C2 Residential Universities
<input checked="" type="checkbox"/>	Car Park
<input checked="" type="checkbox"/>	Court
<input checked="" type="checkbox"/>	D1 Education
<input checked="" type="checkbox"/>	D2 General Assembly and Leisure
<input checked="" type="checkbox"/>	Day Centre
<input checked="" type="checkbox"/>	Dwellings
<input checked="" type="checkbox"/>	Emergency Services
<input checked="" type="checkbox"/>	Hospital
<input checked="" type="checkbox"/>	Industrial
<input checked="" type="checkbox"/>	Library Museum Gallery
<input checked="" type="checkbox"/>	Primary Health Care
<input checked="" type="checkbox"/>	Prison

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Initial parametric
studies

Choice of glazing
type

Early Concept Benchmark

Select Glazing

Choose the glazing to be applied to transparent constructions in the analysis.

Constructions

constructions ecobim glazing edit.tcd

Construction	g Value	U Value
guardian SN 40/23	0.222	1.431
guardian SN 51/28	0.26	1.427
guardian SN 62/34	0.313	1.429
guardian SN 70/37	0.351	1.42
SGG SKN 474	0.45	1.46
SGG SKN 154	0.376	1.393
SGG SKN 165	0.402	1.46
SGG SKN 754	0.319	1.393
SGG SKN 144	0.41	1.46
SGG xtreme 60/28	0.315	1.393
SGG SKN 174	0.461	1.46
SGG SKN 074	0.47	1.46
Pilk Insulight 70/40	0.365	1.087
Pilk Insulight 70/35	0.326	0.986
Pilk Insulight 66/33	0.309	0.986
Pilk Insulight 50/25	0.24	0.986
Pilk Insulight 40/22	0.197	1.087
Pilk Insulight 30/17	0.162	1.087
Pilk Insulight 70/40 triple glazing	0.315	0.601
Pilk K glass clear DG	0.672	1.794
Pilk K glass clear DG 40% frit	0.494	1.794
Pilk K glass clear DG 60% frit	0.405	1.794

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Initial parametric
studies

Choice of
weather data for
14 locations

Early Concept Benchmark**Select CIBSE Weather File**

CIBSE Test Reference Year weather files for 14 locations in the UK

CIBSE Weather File

Swindon TRY
Southampton TRY
Plymouth TRY
Nottingham TRY
Norwich TRY
Newcastle TRY
Manchester TRY
London TRY
Leeds TRY
Glasgow TRY
Edinburgh TRY
Cardiff TRY
Birmingham TRY
Belfast TRY

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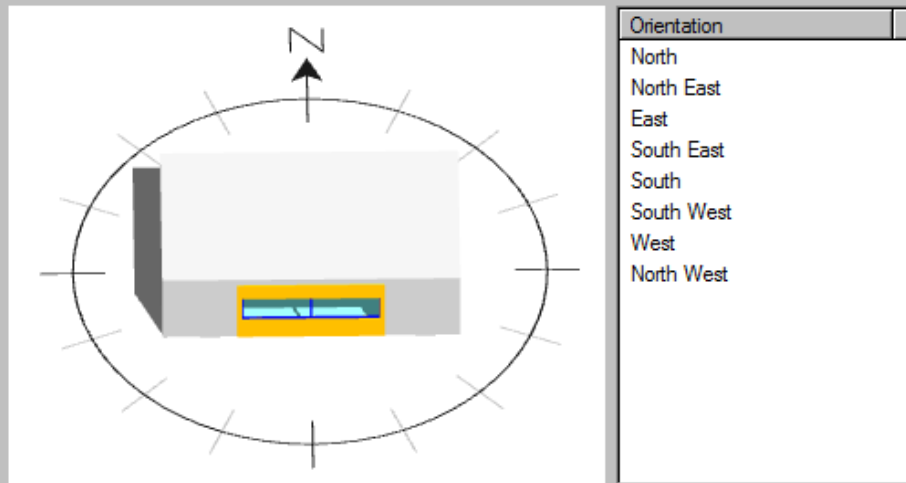
Initial parametric
studies

Choice of
orientation

Early Concept Benchmark

Select Facade Orientation

Select the direction(s) that the facade faces for the analysis.



The interface shows a circular orientation dial on the left and a list of orientation options on the right. The dial has a north arrow at the top and tick marks around its perimeter. A grey rectangular building footprint is overlaid on the dial, with a yellow rectangular area on its bottom edge indicating the selected facade orientation.

Orientation
North
North East
East
South East
South
South West
West
North West

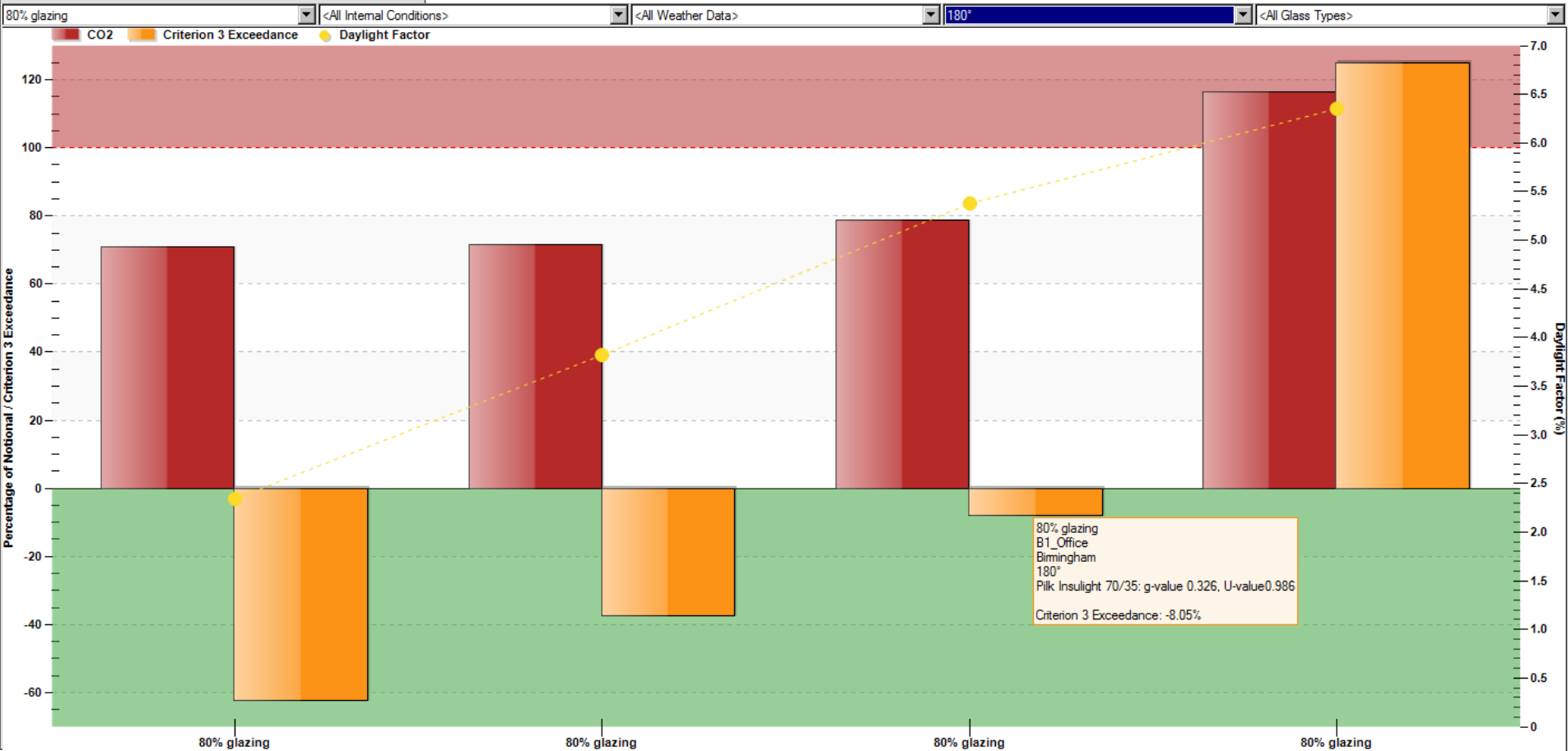
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80% glazing, south facing and 4 glass types

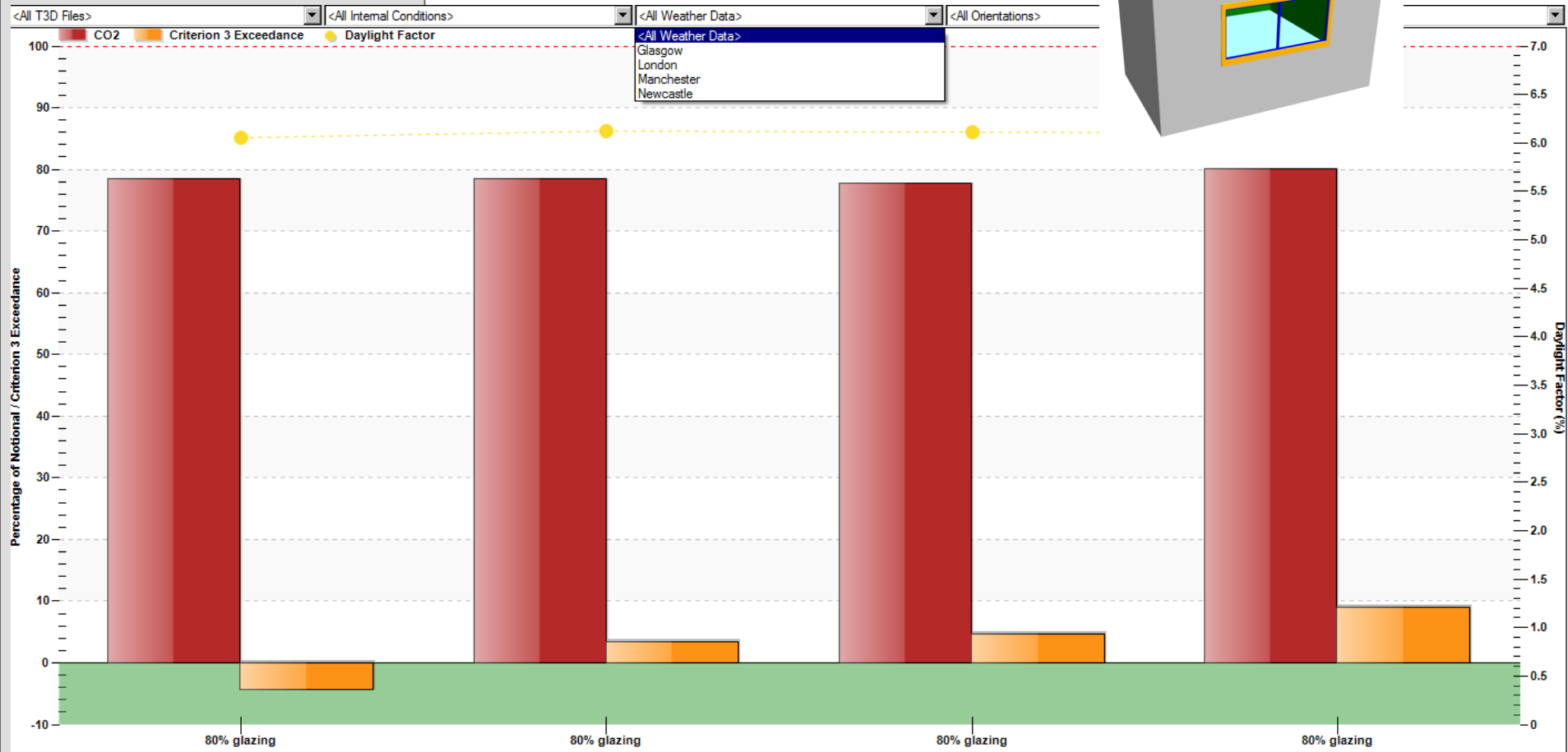
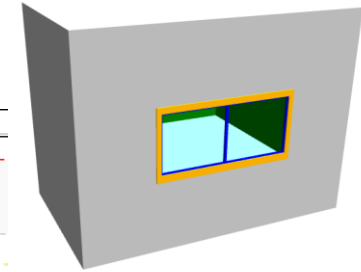
- Pilkington insulight 30/17
- Pilkington insulight 50/25
- Pilkington insulight 70/35
- Pilkington clear double glazing



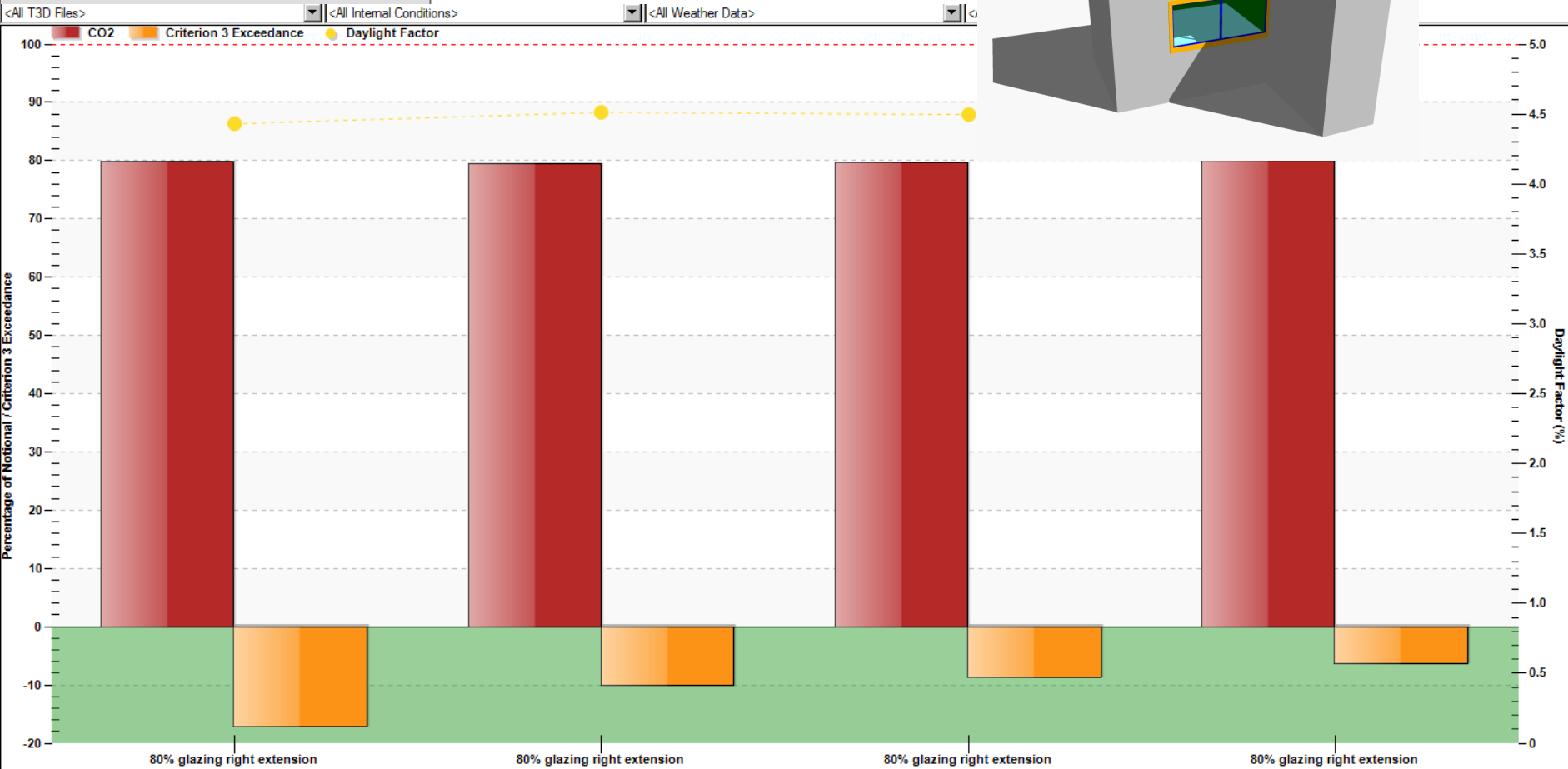
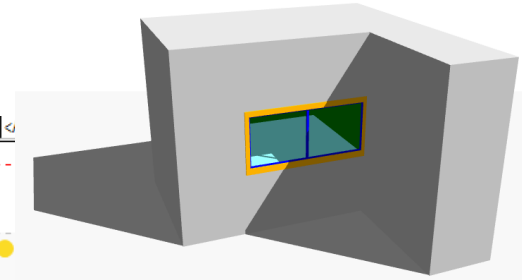
CO2 breakdown with 80% glazing, south facing and 4 glass types



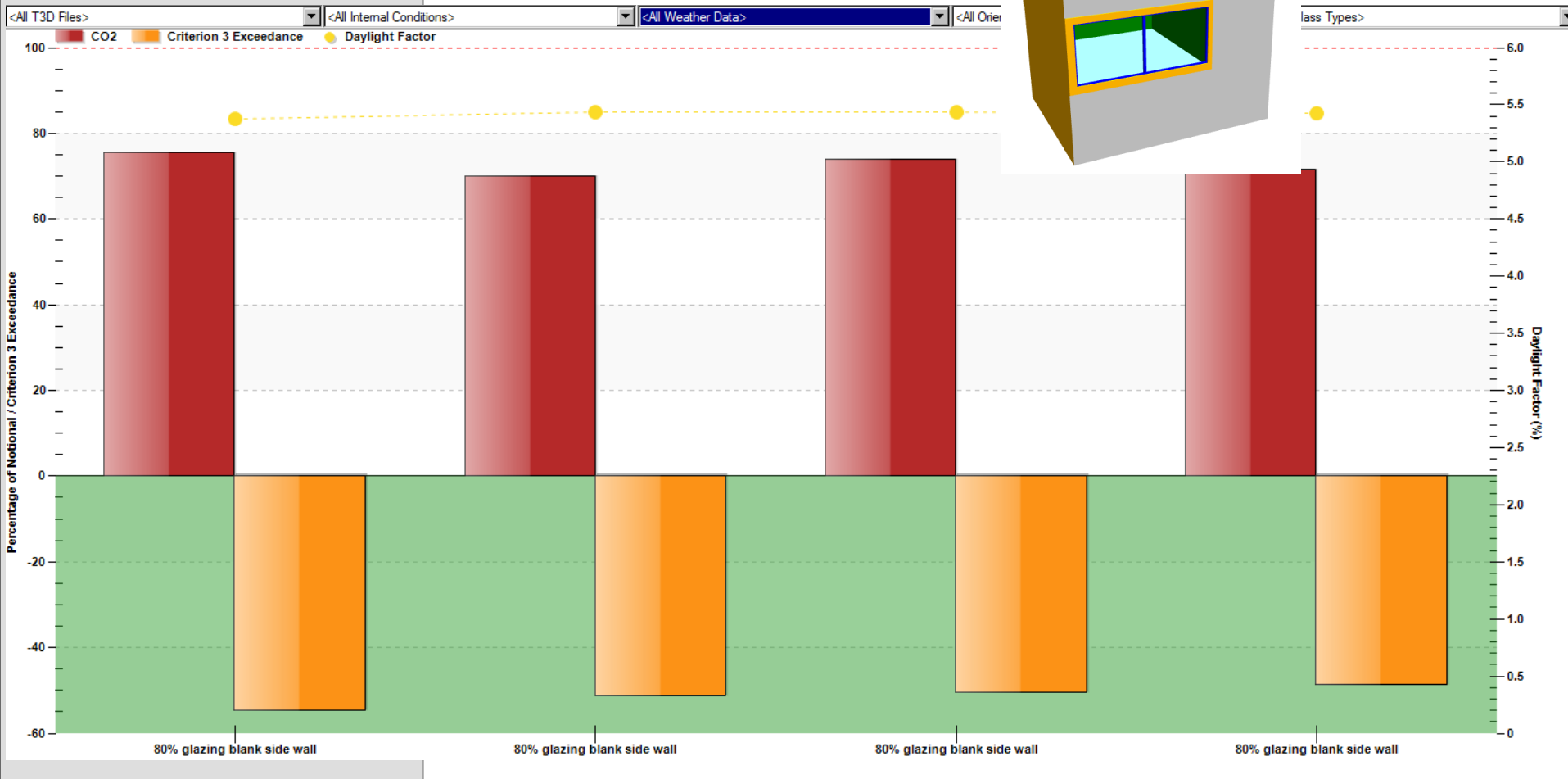
4 locations with the same 80% Pilkington insulight 70/35



4 locations with the same 80% Pilkington insulight 70/35 with some overshadowing

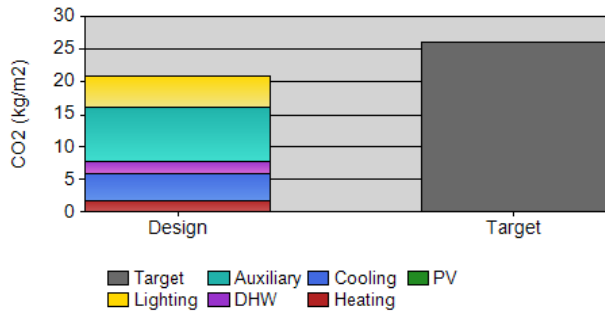
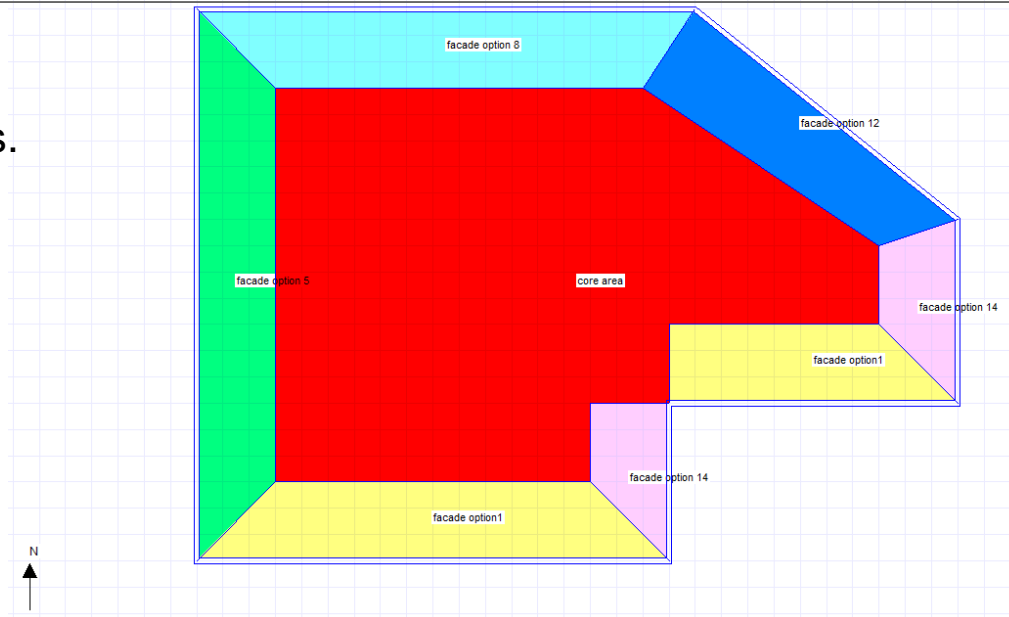


4 locations with the same 80% Pilkington insulight 70/35 with second exposed wall with no glass

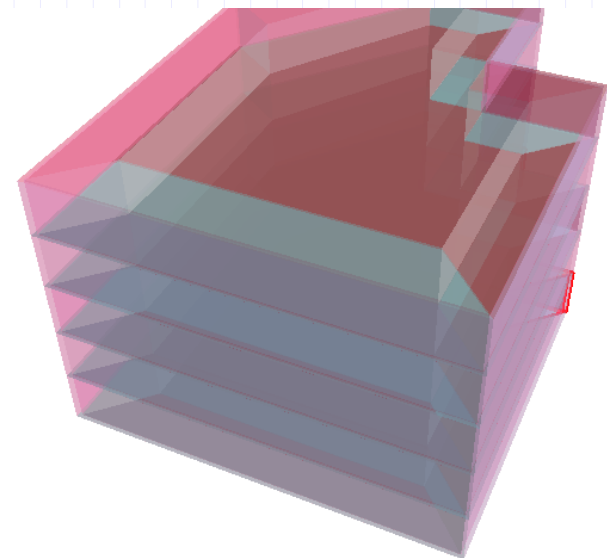


Allocation of façade types to floor plans.

The previously calculated performance of the façade types and core, over the number of floors determines overall Building performance.

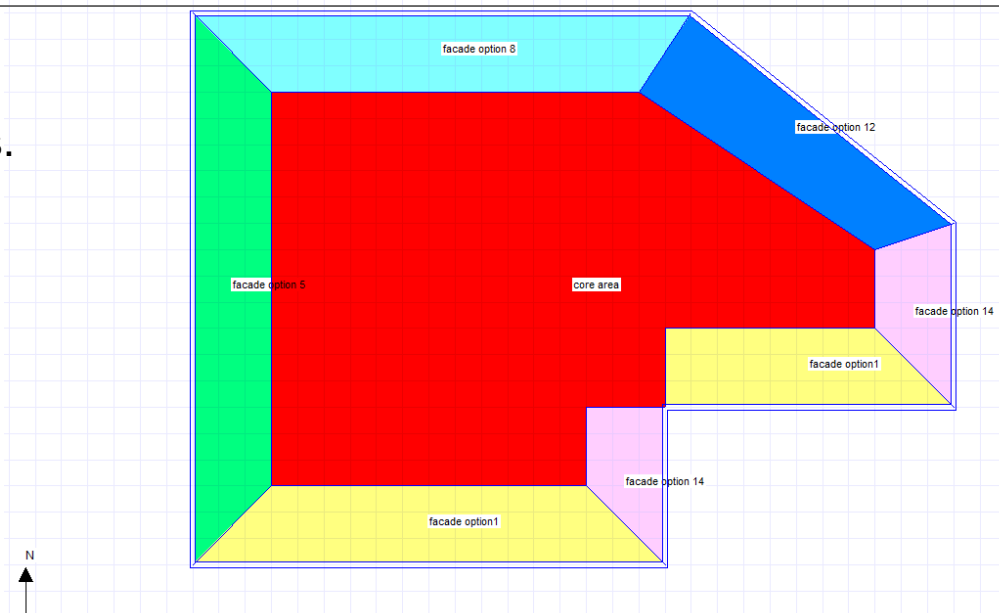


CO2 Improvement:	20.2%
PV Contribution:	0.0%
Building Emissions:	20.74 kgCO2/m2
Target Emissions:	25.98 kgCO2/m2
PV Offset CO2:	0.00 kgCO2/m2



Allocation of façade types to floor plans.

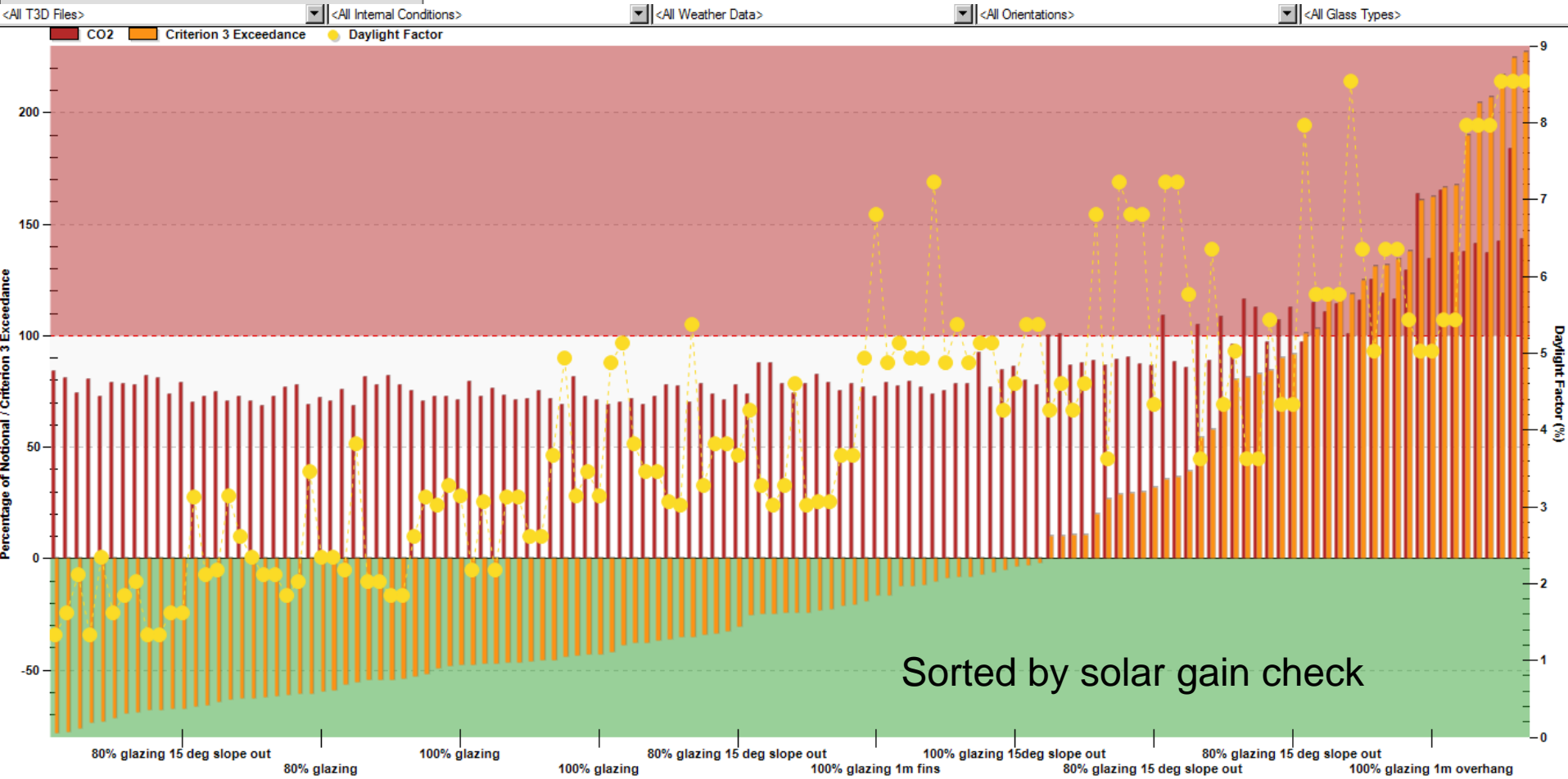
The previously calculated performance of the façade types and core, over the number of floors determines overall Building performance.



Facade Designer Floor Results

Facade	Area (m2)	Lighting *	Auxiliary *	DHW *	Cooling *	Heating *	BER *	TER *
80%Glzng_B1_Office_BIR_PilkInsulight7035								
south	144.01	4.46	8.61	0.69	6.17	0.93	20.85	26.5
west	111.51	4.46	8.11	0.69	5.56	1.28	20.1	25.79
north	102.91	4.46	5.78	0.69	3.83	1.65	16.4	23.38
northeast	46.86	4.45	8.43	0.69	4.33	1.61	19.5	25.01
east	65.71	4.46	9.3	0.69	5.54	1.36	21.35	26.56
Core_B1_Office_BIR								
core	237	14.1	5.95	0.69	6.37	0.35	27.44	27.44
CompositeResult	708	7.68	7.28	0.69	5.62	0.98	22.25	26.16

8 façade models, 4 orientations and 4 glass types (128 variations)

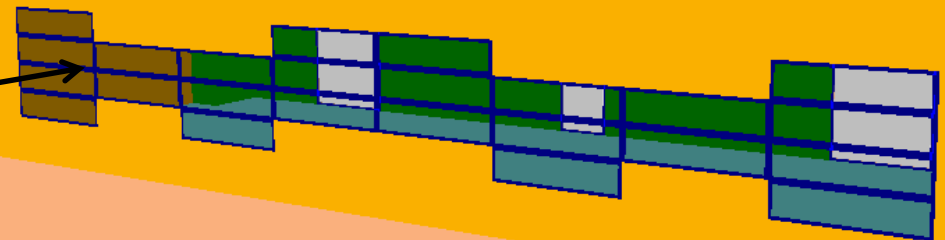
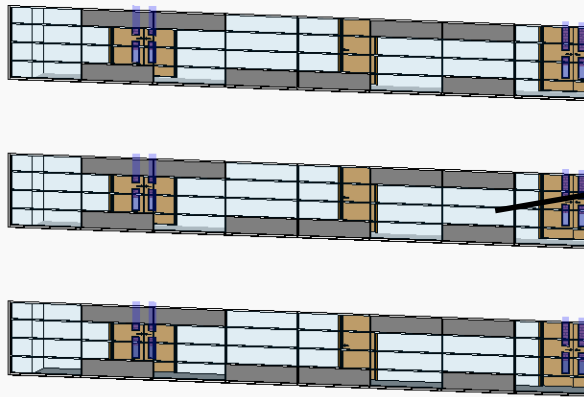


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Parametric studies using more specific façade models built in Revit

Following the initial parametric studies architects may create their own façade models in Revit, which may be imported into ecobim for more specific parametric analysis and massing studies. These self built, single space, façade models may be added to the façade database.



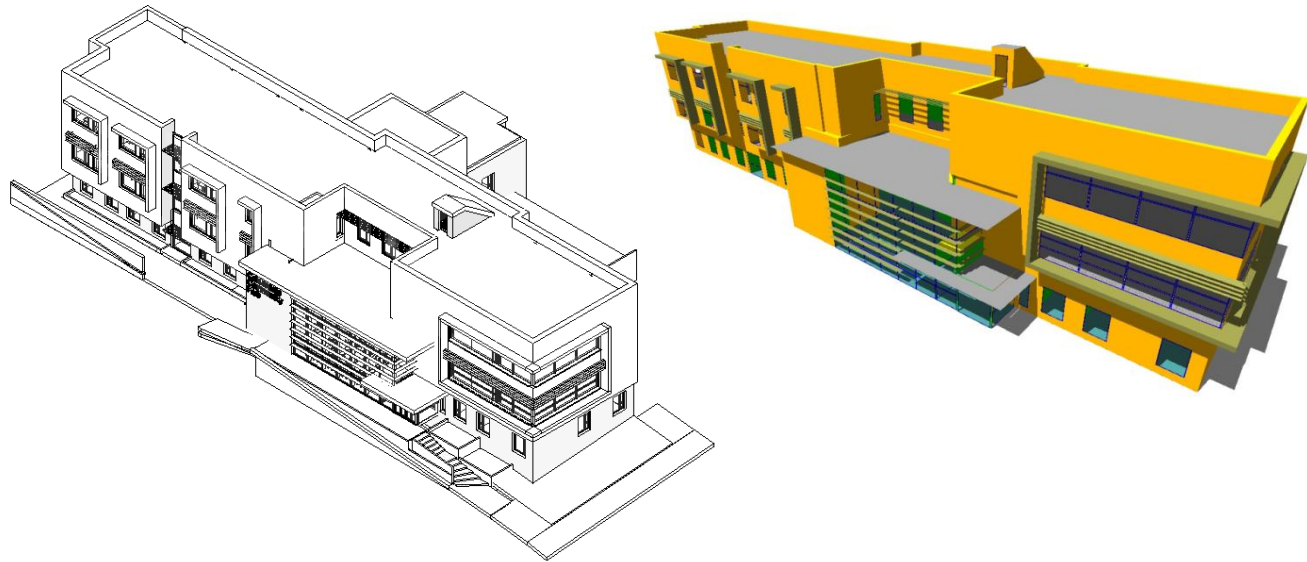
Imported Revit façade space in ecobim

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ecobim

Compliance checking more advanced Revit models

As the design develops more advanced Revit models may be imported into ecobim for compliance checking. The whole model or selected parts of the model may be imported.





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compliance of architectural designs with
UK Building Regulations Part L2

Compliant with UK Part L, CIBSE, ASHRAE and CEN standards

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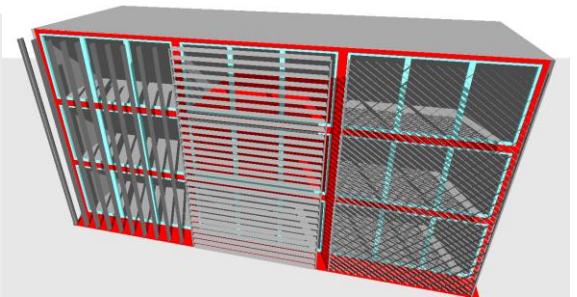
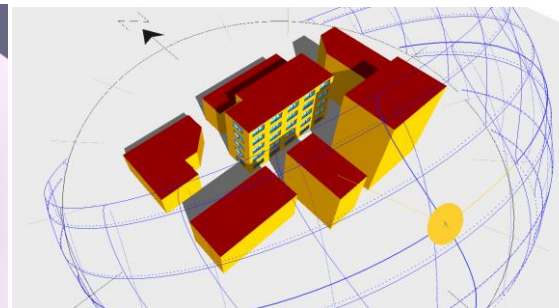
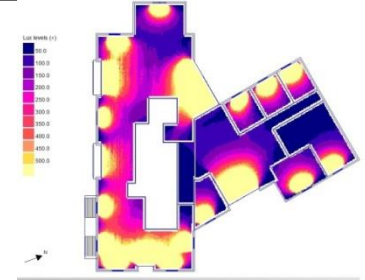
eco
bim

Additional studies

Detailed internal daylight studies showing daylight levels and distribution, including borrowed light.

Detailed external daylight studies, including right to light.

Advanced shading systems design for solar and daylight evaluation.



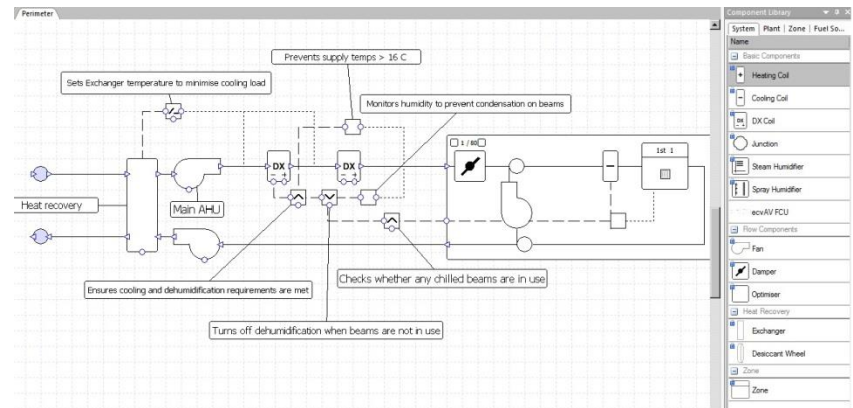
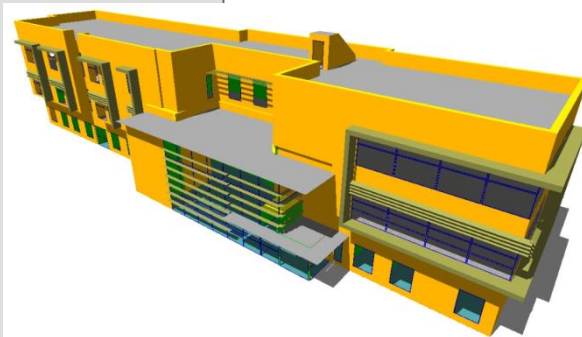
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Working with engineers

ecobim is interoperable with EDSL Tas Engineering software. Models created in ecobim may be opened in the engineering software and vice versa.

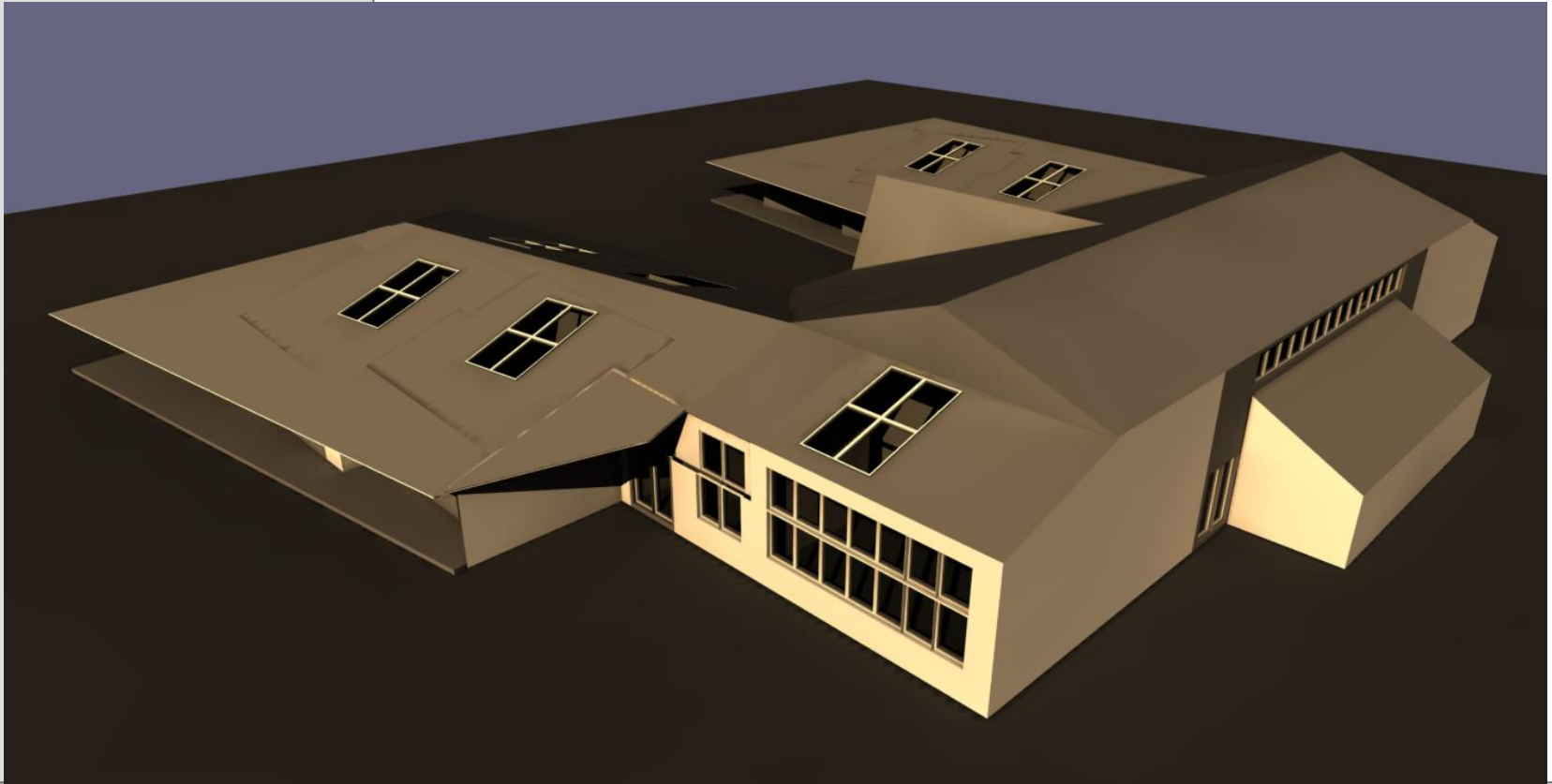
This is an important part of the Green BIM process.



The Leadenhall Building

The screenshot displays the EDSL Tas 3D Modeller interface for the Leadenhall Building. The main window shows a 3D perspective view of the building's facade. A secondary window, 'Plan View - Level 7', displays a 2D floor plan with a color-coded daylight simulation. The simulation shows a central area with low daylight (dark blue) and a perimeter area with high daylight (yellow). A 'Factor and lux level ranges' panel provides two color scales: Daylight Factors (0.500 to 5.000) and Lux levels (50.0 to 500.0). The 'Daylight Calculations' panel is open, showing settings for Sky (CIE, Overcast), Day (21), Month (June), and Hour (12). Calculation areas are defined with a working plane height of 0.7m, area margin from walls of 0.25m, and display grid size of 0.5m. The 'Daylight View Settings' panel shows the current view is a 'Preview' of 'CIE' sky conditions on June 21st at 10:00. The interface includes a standard Windows taskbar at the bottom with the Start button and application icons for Internet Explorer, File Explorer, and Photoshop.

Advanced models may imported from Revit into ecobim.



Daylight study

Tas 3D Modeller - [Plan View - Ground Floor]

File Edit Building View Tools Window Workspace Analysis Daylight Ecobim Help

Daylight Factors (<)

- 0.500
- 1.000
- 1.500
- 2.000
- 2.500
- 3.000
- 3.500
- 4.000
- 4.500
- 5.000

Daylight Calculation <Current Calculation> (23/12/2014 10:28:28)

Reflectance convergence for preview : results for CIE Overcast sky on day 173 at hour 12:00

Name	Daylight Factor %	Maximum Factor	Minimum Factor	Average Lux	Maximum Lux	Minimum Lux	Uniformity (min/average)	Percentage above base
Year class								
Year class 1	7.286	14.566	0.931	2137.572	4273.268	273.074	0.128	96.747
Year class 2	7.444	15.006	1.782	2183.962	4402.572	522.654	0.239	99.634
Year class 3	7.869	14.869	1.527	2308.585	4362.15	447.986	0.194	99.202
Year class 4 R28	8.268	14.33	2.956	2425.525	4204.071	867.086	0.357	100.0
Year class 5 R30	7.794	14.592	1.494	2286.691	4280.976	438.257	0.192	99.422
Year class 6 R32	2.427	5.216	0.641	712.09	1530.125	188.14	0.264	54.196
Year class 4 R27	7.25	14.277	0.919	2127.109	4188.638	269.658	0.127	95.565
Year class 5 R29	7.655	14.376	1.762	2245.953	4217.688	516.885	0.23	99.602
Year class 6 R31	2.427	4.956	0.324	712.033	1454.024	95.146	0.134	59.545
Year class Reception	2.047	4.957	0.15	600.595	1454.139	44.018	0.073	43.036
New Zone Set								
Staffroom	7.854	14.364	1.414	2304.231	4214.104	414.93	0.18	94.322
Head	4.262	12.787	1.301	1250.489	3751.511	381.584	0.305	77.143
Art	9.723	22.849	0.185	2852.624	6703.409	54.366	0.019	93.019
Hall	0.987	10.265	0.172	289.601	3011.489	50.529	0.174	4.358
Library	0.873	3.326	0.145	255.986	975.865	42.448	0.166	5.351
Music	10.47	20.602	2.81	3071.785	6044.245	824.486	0.268	100.0

Base (for % above) Display fill ranges... Copy Results Save Factors for Building Analysis

Exposed floor
Roof
Internal Floor

Windows
5x W1 hl
D1
D2
Hall
Hall hl
Rooflight

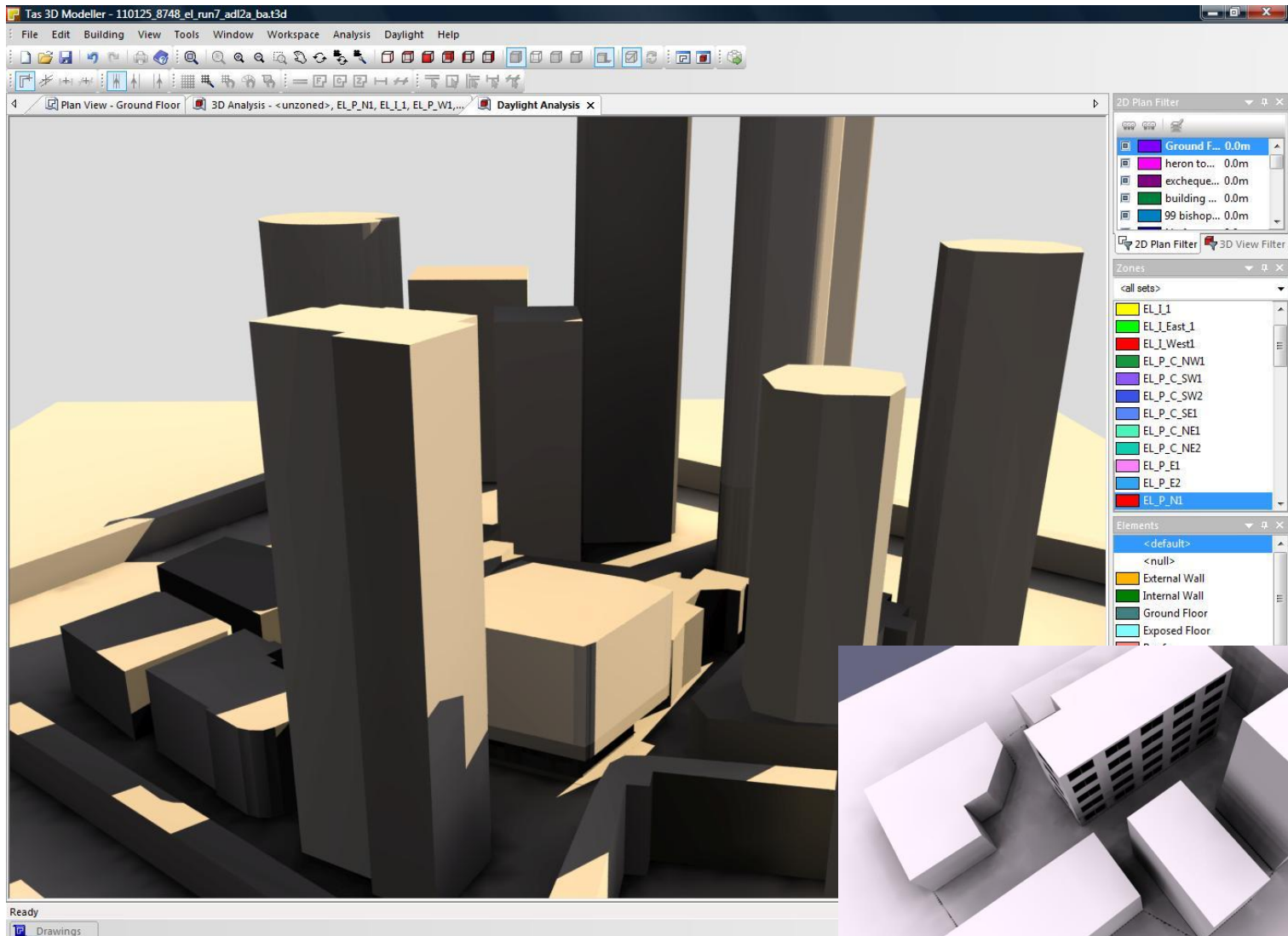
Windows Shades

Ready Drawings

Start

EN 12:55 23/12/2014

City scape daylight and solar gain simulation



Tas beam & diffuse solar shading

