



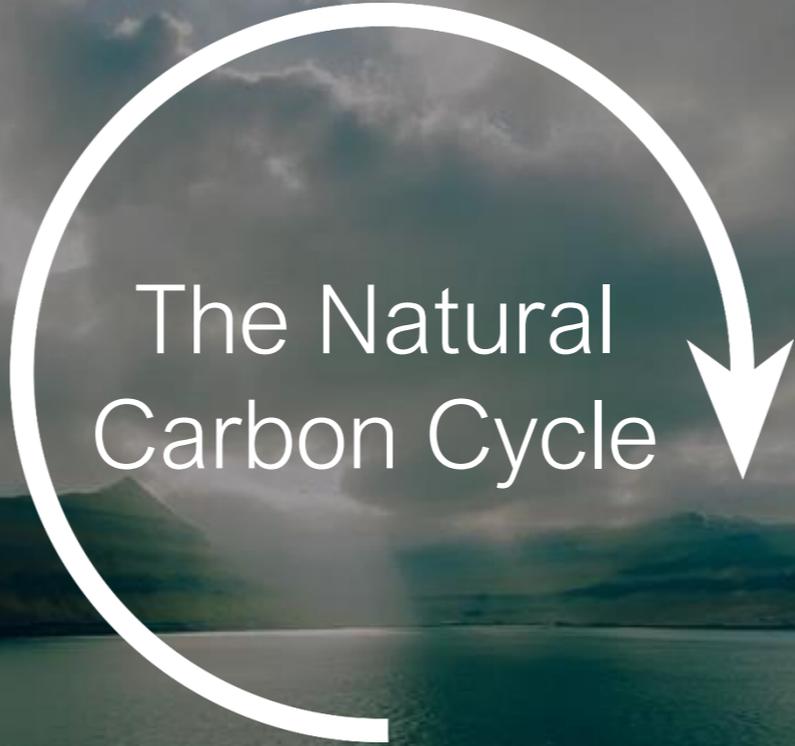
65% to 70%

Carbon Reduction by 2030

40%

Reduction of Energy Intensity by 2025

Human Contribution +



The Natural  
Carbon Cycle

= Climate Change



68%

Electricity Generation



# Air Conditioning

Reduce indirect carbon emissions



# 3 Solutions

1. Architectural
2. Building Systems
3. Renewable Energy



## New Buildings

- Lean design to **reduce energy demand**
- **Compare** different design solutions.
- This can be calculated in the **early design phase** with dedicated software solutions.



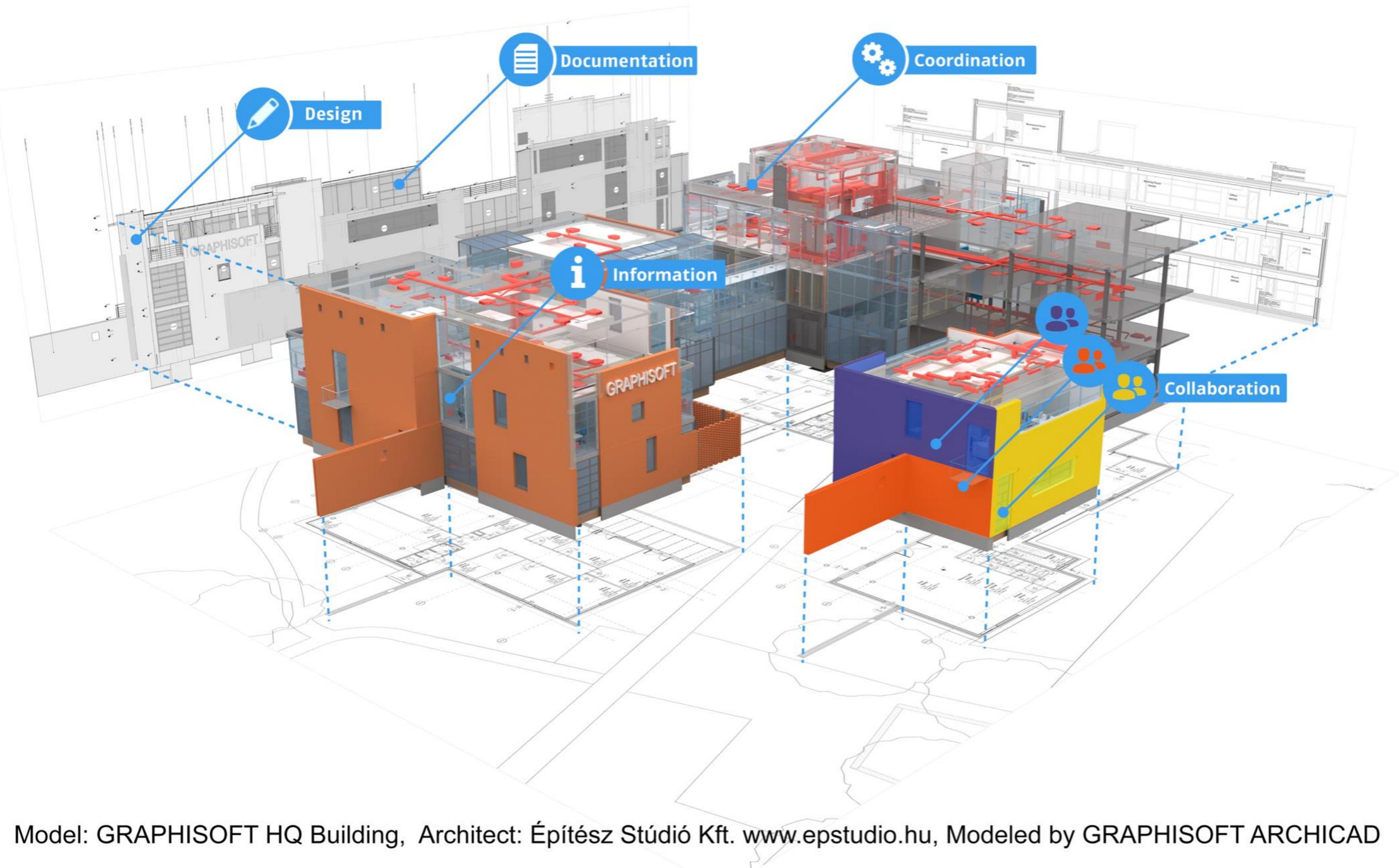
## Incentives

- Early design changes can lead to significant **savings in later stages** of a project lifecycle.
- Developers get **GFA incentive** for BEAMplus certificate

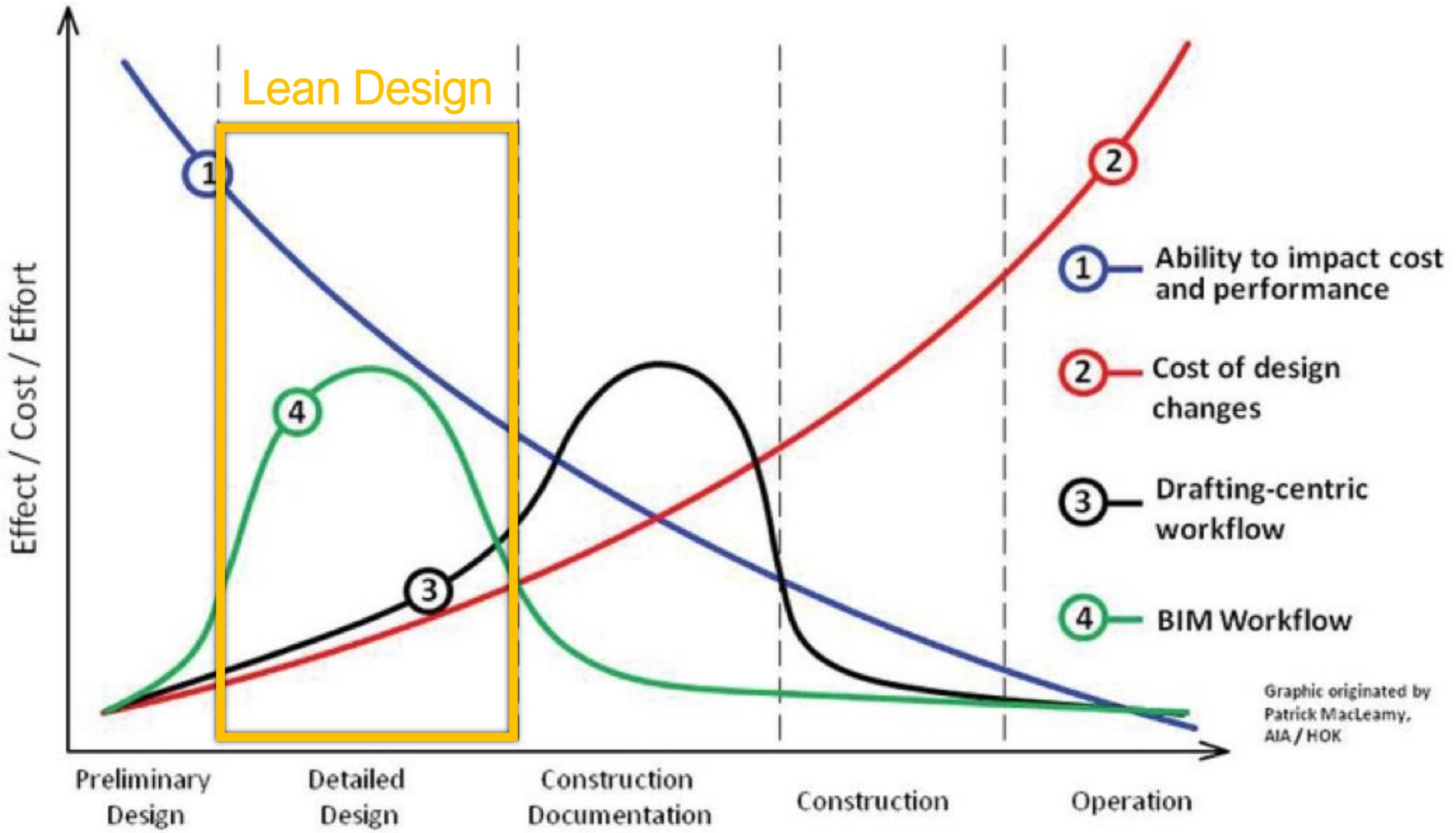


## Old Buildings

- Over 85% of buildings are 10 years or older.
- Simply improving fenestration can lead to a **20% reduction** in cooling demand.
- All this can be estimated by **dedicated software solutions.**

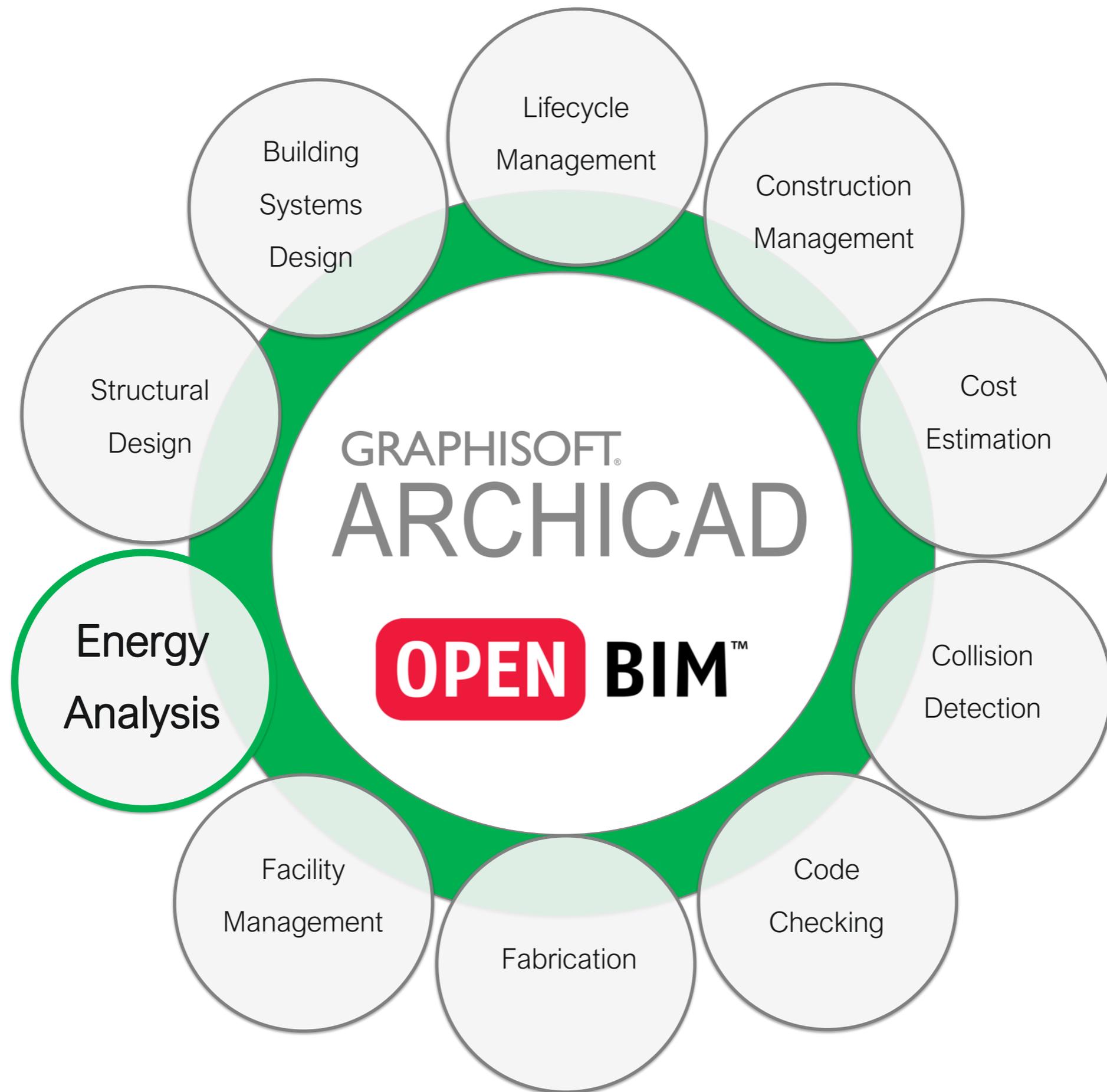


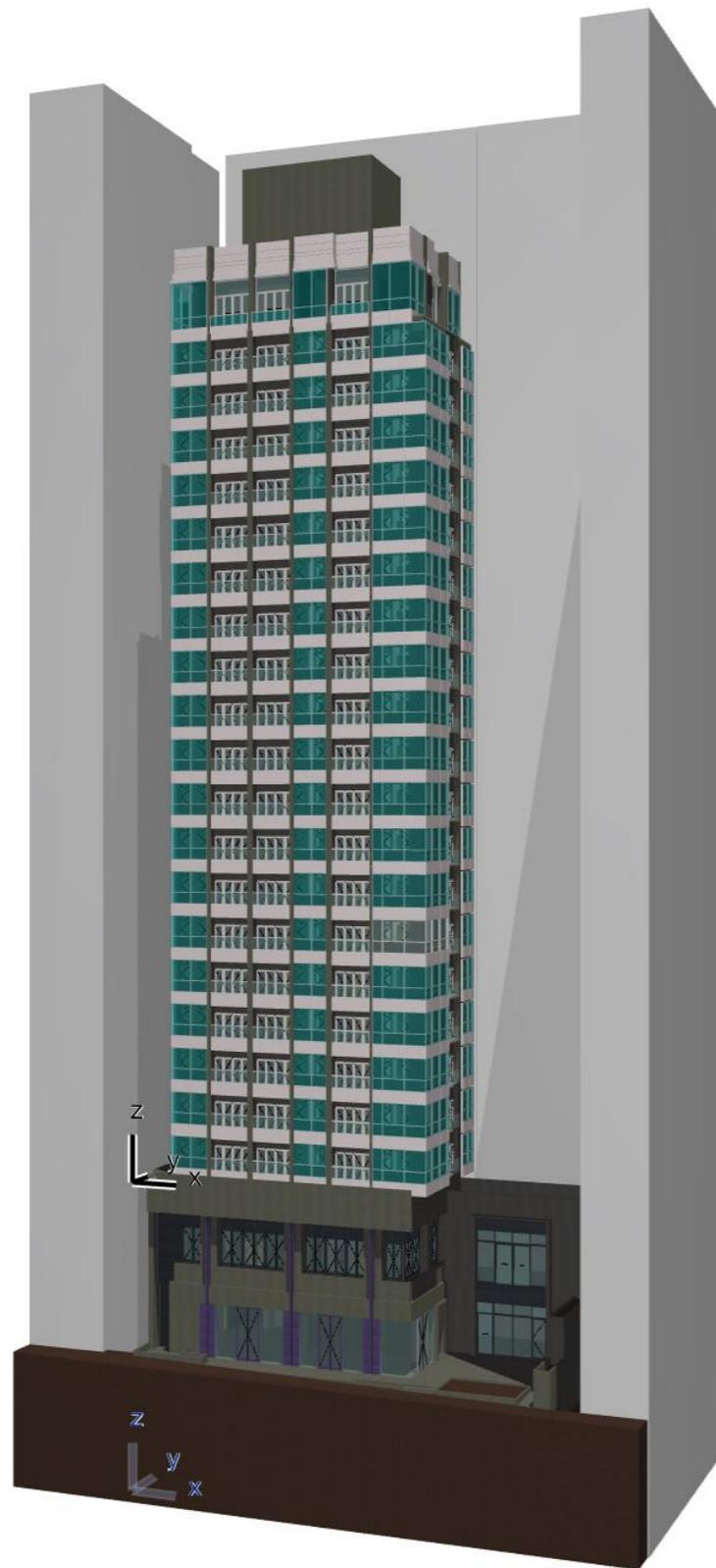
Model: GRAPHISOFT HQ Building, Architect: Építész Stúdió Kft. [www.epstudio.hu](http://www.epstudio.hu), Modeled by GRAPHISOFT ARCHICAD



Graphic originated by Patrick MacLeamy, AIA / HOK

Introduced in the Construction Users Roundtable's "Collaboration, Integrated Information, and the Project Lifecycle in Building Design and Construction and Operation" (WP-1202, August, 2004)", the "MacLeamy Curve" illustrates the advantages of Integrated Project Delivery.





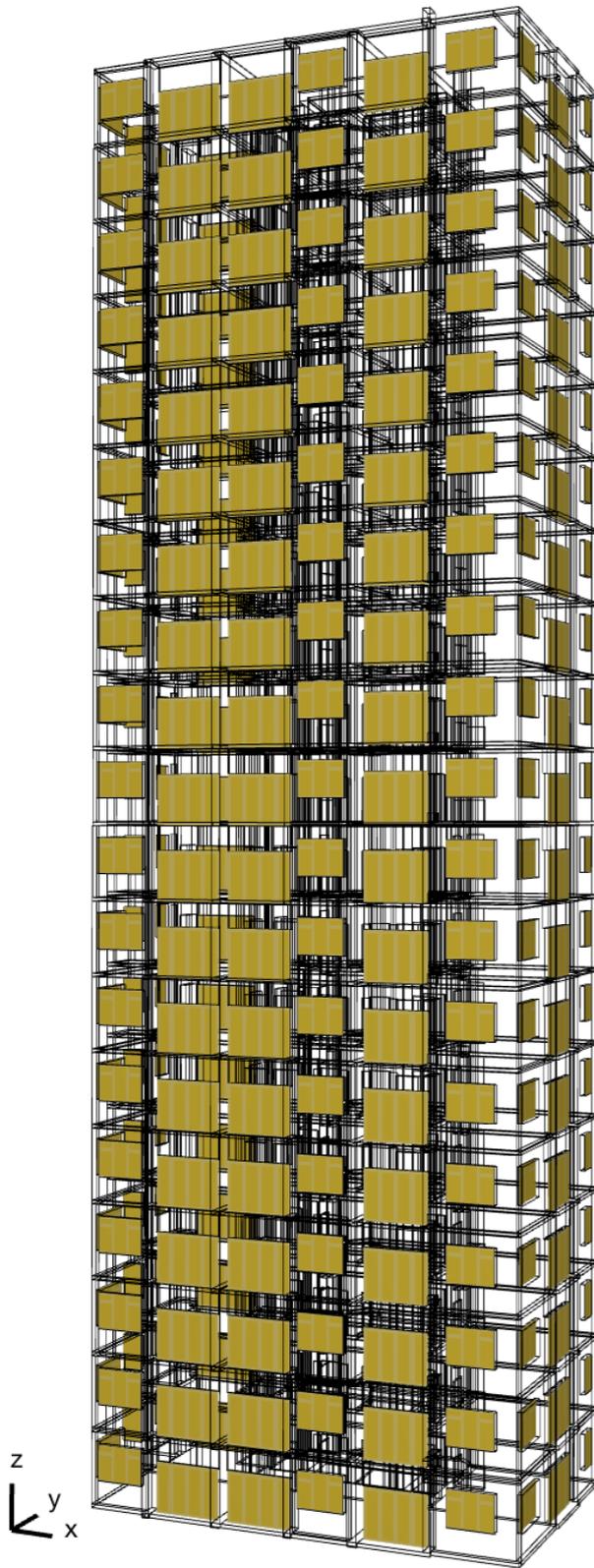
## Typical High Rise Building

- 28 Floors
- 85,000 sqft UFA

## Goal

Calculate ROI of fenestration improvement.

BIM is made in **GRAPHISOFT.**  
**ARCHICAD**



Openings Catalog

Select the best matching transparent item from the catalog:

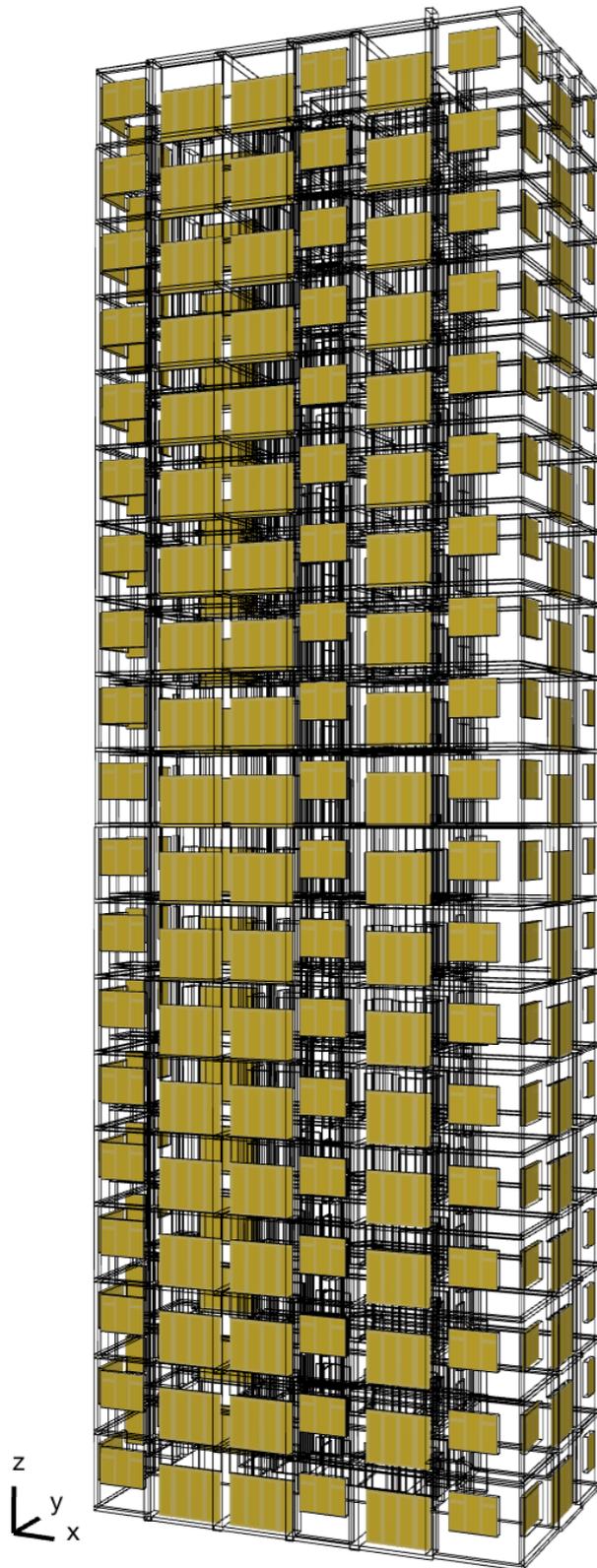
Type	U-value[W/m <sup>2</sup> K]	TST %	DST %
<b>Glazing - single</b>			
Clear	5.8000	87.0000	76.0000
Tinted	5.8000	64.0000	52.0000
<b>Glazing - double - basic</b>			
<b>Glazing - double - standard</b>			
<b>Glazing - double - premium</b>			
<b>Glazing - triple</b>			
Air fill - clear	2.0000	61.0000	49.0000
Argon fill - clear	0.7000	57.0000	46.0000
Argon fill - clear - low E	0.6000	52.0000	40.0000
Xenon fill - clear - low E	0.5000	50.0000	39.0000
<b>Polycarbonate</b>			
<b>Acrylic</b>			
<b>Fiberglass - composite</b>			

Select the best matching opaque item from the catalog:

Type	U-value[W/m <sup>2</sup> K]	Psi-value...	Infiltration [l/sm]
<b>Frame - wood</b>			
Traditional	2.5000	0.2100	2.7700
Basic	2.1100	0.1800	1.4300
Standard	1.8700	0.1500	0.7200
Premium	1.6800	0.1200	0.2800
Ultimate	0.7200	0.0900	0.1200
<b>Frame - plastic</b>			
<b>Frame - metal</b>			
Steel - basic	7.2500	0.6100	2.6900
Aluminum - basic	3.8200	0.3400	1.3800
Aluminum - standard	2.4200	0.1800	0.6700
Aluminum - premium	1.8600	0.1300	0.2300
Aluminum - ultimate	0.7800	0.1000	0.0800
<b>Entry door</b>			
<b>Garage door</b>			

Cancel OK

BIM is made in GRAPHISOFT.  
**ARCHICAD**



Openings Catalog

Select the best matching transparent item from the catalog:

Type	U-value[W/m <sup>2</sup> K]	TST %	DST %
<b>Glazing - single</b>			
Clear	5.8000	87.0000	76.0000
Tinted	5.8000	64.0000	52.0000
<b>Glazing - double - basic</b>			
<b>Glazing - double - standard</b>			
<b>Glazing - double - premium</b>			
<b>Glazing - triple</b>			
Air fill - clear	2.0000	61.0000	49.0000
Argon fill - clear	0.7000	57.0000	46.0000
Argon fill - clear - low E	0.6000	52.0000	40.0000
Xenon fill - clear - low E	0.5000	50.0000	39.0000
<b>Polycarbonate</b>			
<b>Acrylic</b>			
<b>Fiberglass - composite</b>			

Select the best matching opaque item from the catalog:

Type	U-value[W/m <sup>2</sup> K]	Psi-value...	Infiltration [l/sm]
<b>Frame - wood</b>			
Traditional	2.5000	0.2100	2.7700
Basic	2.1100	0.1800	1.4300
Standard	1.8700	0.1500	0.7200
Premium	1.6800	0.1200	0.2800
Ultimate	0.7200	0.0900	0.1200
<b>Frame - plastic</b>			
<b>Frame - metal</b>			
Steel - basic	7.2500	0.6100	2.6900
Aluminum - basic	3.8200	0.3400	1.3800
Aluminum - standard	2.4200	0.1800	0.6700
Aluminum - premium	1.8600	0.1300	0.2300
Aluminum - ultimate	0.7800	0.1000	0.0800
<b>Entry door</b>			
<b>Garage door</b>			

Cancel OK

BIM is made in GRAPHISOFT.  
**ARCHICAD**

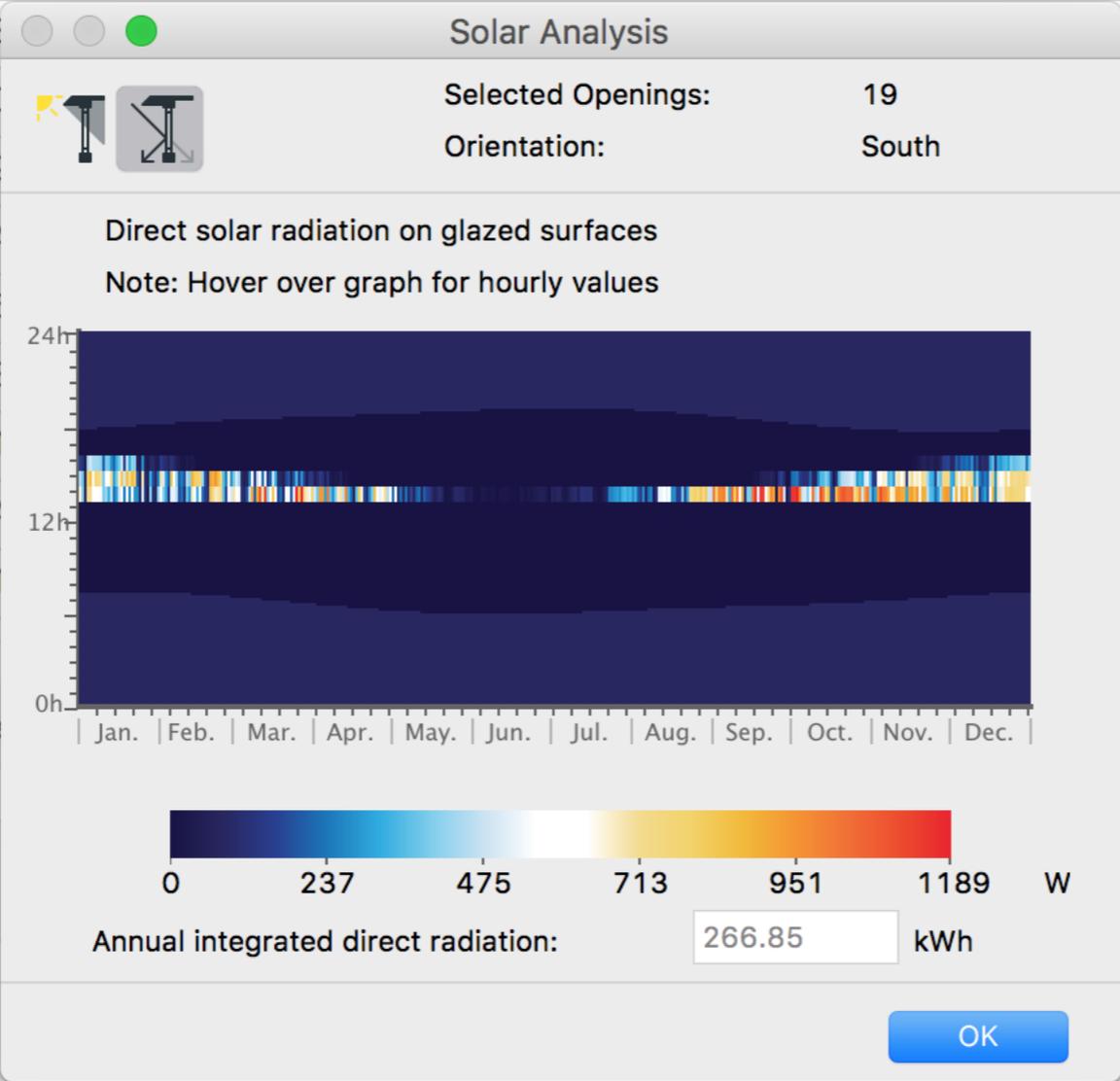


Thermal Blocks Structures **Openings**

Type	Orientation	▲▲ Opaque Area [m <sup>2</sup> ]	Glazed Area [m <sup>2</sup> ]	Total Are...	Solar Analysis	Overall U-value [W/m <sup>2</sup> K]	Infiltration [l/sm]	Shading Device
Door	East	34.43	56.54	90.97	✓ Done	1.47	0.23	External Blind
Window	East	18.49	38.51	57.00	✓ Done	1.57	0.23	External Blind
Window	East	6.41	19.24	25.65	✓ Done	1.32	0.23	External Blind
Door	East	10.8					0.23	External Blind
Door	North	39.0					0.23	External Blind
Door	South	67.9					0.23	External Blind
Window	South	55.4					0.23	External Blind
Door	South	33.5					0.23	External Blind
Door	South	33.8					0.23	External Blind
Window	South	6.41					0.23	External Blind
Window	West	18.4					0.23	External Blind
Window	West	6.41					0.23	External Blind

Show uniform items as a single element

Total area threshold:



- None
- Sunscreen 10%
- Sunscreen 40%
- Sunscreen 60%
- Sunscreen 80%
- External Blind
- External Louver
- Overhang
- Overhang And Side Fins
- Large Overhang
- Large Left Side Fin
- Large Right Side Fin
- Large Side Fins
- Solar Analysis Off

BIM is made in GRAPHISOFT ARCHICAD

## Performance Rating Table

Energy Use	Units	Proposed Design Results	BaseLine Building Results	Savings %
Heating	Energy Use (kWh)	63.46	68270.04	7.04
	Peak Demand (kW)	0.23	257.27	8.72
Cooling	Energy Use (kWh)	340.31	437933.43	22.29
	Peak Demand (kW)	0.24	319.80	23.70
Service Hot-Water	Energy Use (kWh)	0.00	0.00	0.00
	Peak Demand (kW)	0.00	0.00	0.00
Ventilation Fans	Energy Use (kWh)	0.00	0.00	0.00
	Peak Demand (kW)	0.00	0.00	0.00
Lighting	Energy Use (kWh)	24.02	24017.40	0.00
	Peak Demand (kW)	0.01	9.40	0.00
Equipment	Energy Use (kWh)	0.00	0.00	0.00
	Peak Demand (kW)	0.00	0.00	0.00
Total Annual Energy Use: (kWh/a)		427784.14	530220.88	19.32
Annual Process Energy: (kWh/a)		24017.40	24017.40	0.00

**20% savings on annual energy demand**

BIM is made in GRAPHISOFT.  
**ARCHICAD**

# BIM+BEAM Plus Enabled Building Design

Use of BIM data to generate Green Scoring with respect to building materials, neighborhood amenities

The screenshot shows the ArchiCAD interface with the HKBEAM PLUS Assessment Tool open. The tool is used for generating green scores based on BIM data. The main window displays a tree view of assessment criteria on the left and a data table on the right. The table shows waste management metrics for a demolition project.

	Total amount generated from demolition	Total amount recycled within site	Total amount sent to landfill/public fill	Total amount recycled offsite
Foundational waste at demolition site	1000.00	200.00	300.00	200.00
Superstructure waste at demolition site	500.00	0.00	50.00	50.00
<b>Total waste at demolition site</b>	<b>1500.00</b>	<b>200.00</b>	<b>350.00</b>	<b>250.00</b>
Total waste amount generated from demolition activities: 1500.00				
Total amount recycled within site: 200.00				
Total amount sent to landfill/public fill: 350.00				
Total amount recycled offsite: 250.00				
% of demolition waste recycled: 30.00				

Below the table, there is an 'Explanation to fulfill BEAM Plus criteria' section with a text input field containing 'exp\_ma\_10'. There are also checkboxes for 'Enclosures' and a 'Credit(s) Earned' field showing '1/2'. Buttons for 'Save', 'Report', and 'Calculate' are visible at the bottom of the tool window.

The screenshot shows a Microsoft Word document titled "BEAM Plus for New Buildings Submission Template for WU 6 Effluent Discharge to Foul Sewers (BEAM Plus 2012/v1.2)". The document contains the following information:

**Credit Requirements:** 1 credit for demonstrating a reduction in annual sewage volumes by 20% or more.

**Project Name:**

Credit Attainable:	1
Credit anticipated for this submission:	1

**Nature of Project:**

- Project Space Design

Water consumption of flow devices (water closet, urinal)

Device Equipment	Water Use per Operation or Cycle (l)	Daily No. of Operations	Daily Water Use (l)
Water closet	5.2	5	520
Urinal	0	0	0
Others			

- Baseline Space

Water consumption of flow devices (water closet, urinal)

Device Equipment	Water Use per Operation or Cycle (l)	Daily No. of Operations	Daily Water Use (l)
Water closet	7.5	5	750

# BIM+BEAM Plus Enabled Building Design

## Use of BIM data to generate BEAM Plus Scoreboard

The screenshot shows the ArchiCAD software interface with a 3D model of a building. A 'Project Dashboard' window is open, displaying the following information:

**Project Detail**

- Type:  Residential  Non-Residential
- Building: URA
- Address: URA
- Save Location: C:\Users\bensochan\Desktop\URA\_TEST
- HK Beam Plus New Building

**Version 1.2**

Aspect	Attained Credits	Grade
Site Aspect:	12.0 / 22.0	Platinum
Material Aspect:	4.0 / 22.0	
Energy Use:	29.0 / 42.0	Platinum
Water Use:	1.0 / 9.0	
Indoor Environmental Quality:	1.0 / 9.0	Platinum
Innovation:	6.0 / 0.0	Platinum
<b>Total Score:</b>	<b>78.20</b>	<b>Platinum</b>

The dashboard also features a 'BEAM Plus Scoreboard' graphic showing a green arc and the word 'Platinum'. A 'Start Assessment' button is visible at the bottom left of the dashboard.

At the bottom of the image, the HKGBC BEAM Plus logo is shown on the left, and four award level icons are displayed from left to right: Platinum (白金級), Gold (金級), Silver (銀級), and Bronze (銅級). Each icon includes the text 'HKGBC BEAM Plus 綠建環評'.

**CASE STUDY** | EcoDesigner information key to gaining Planning Consent



“All of the major design decisions, whether to go timber frame with low thermal mass or conventional build with heavier mass have been checked using EcoDesigner because it is so easy and quick!”

Rod Hughes, Director, 2030 Architects Ltd.



**CASE STUDY** | Making Old become New, and Efficient! 53-55 Botanic Road, Liverpool



“Our strong focus on sustainability, as illustrated by the certifications we hold, means we are able to assess quickly the value of building performance software. EcoDesigner has proved to be an extremely valuable tool in helping us refine and test our ideas throughout design, from early concepts to documentation.”

Jon Moorhouse,  
Constructive Thinking Studio, Ltd



## CASE STUDY | Rural Regeneration Centre, Hadlow College

uses **10%** of the typical energy consumption  
of a modern building

Over **95%** of the original shed structure  
was retained on site

...the structure was airtight to a very high standard of

**0.34h<sup>-1</sup>**



“Designing and building Hadlow College to certified Passivhaus standard, at less than £1,500/ m<sup>2</sup>, was only possible using the right BIM software and the right prefabricated system.”

James Anwyl, Director, EUROBUILD

“EUROBUILD delivered a fantastic, innovative sustainable design that has won numerous awards – exactly what we asked for and more - and investing in the early stage design development really paid dividends during the construction phase.”

Mark Lumsdon-Taylor, Hadlow College Finance Director

An aerial photograph of a dense urban skyline, likely in Hong Kong, featuring numerous high-rise apartment buildings of varying heights and colors. The buildings are packed closely together, creating a complex, layered appearance. The sky is a pale, hazy blue, and the overall lighting is soft, suggesting an overcast day or early morning/late afternoon. The text is overlaid in the center of the image.

We can reduce the carbon emissions of our built environment via BIM-based energy optimization.