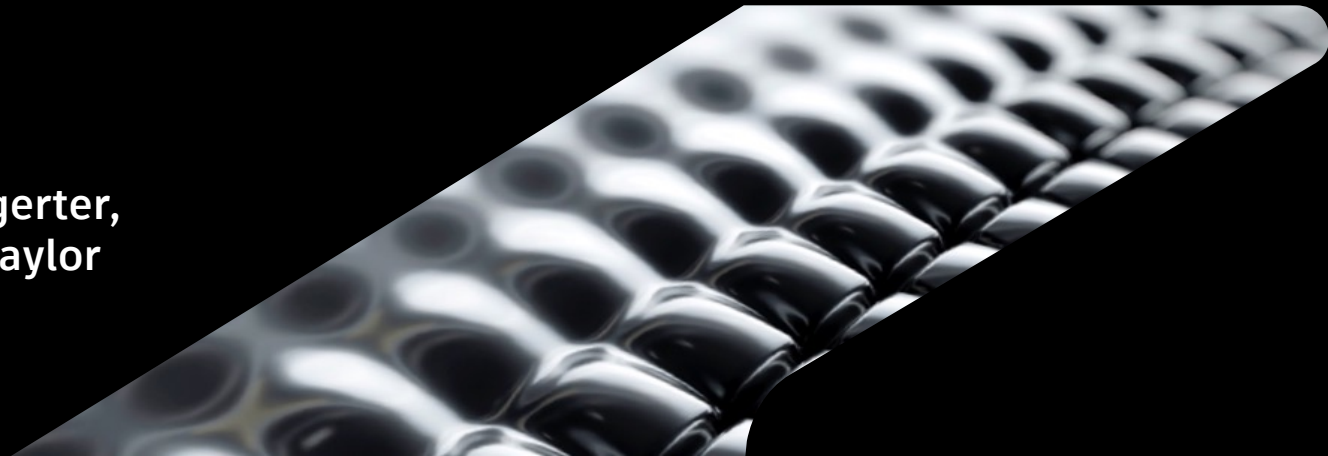




# **Greenwashing? Not here.**

## Autodesk's New Sustainability Consulting Practice

Jonathan Rowe, Amy Egerter,  
Carol Battle, & Justin Taylor



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# Agenda

- Sustainability at Autodesk
- Who We are
- How we are creating impact
- How to Work with Us
- Q&A



# Learning Objectives

1. Learn about sustainability-related issues facing Autodesk customers.
2. Learn about the consulting services offered by the Sustainability Consulting Practice.
3. Learn about contacting Autodesk to use Sustainability Consulting Practice expertise.
4. Have a clear understanding of Autodesk's internal and external sustainability strategy.



# **Sustainability at Autodesk**

# Autodesk's Impact Strategy

Improve our  
operations

Partner with  
customers

Advance  
industries

THREE WAYS WE CREATE IMPACT

THREE IMPACT OPPORTUNITY  
AREAS





# Autodesk's Sustainability Consulting Practice



**Jonathan Rowe**  
San Francisco  
Global Lead



**Amy Egerter**  
San Francisco  
AMER

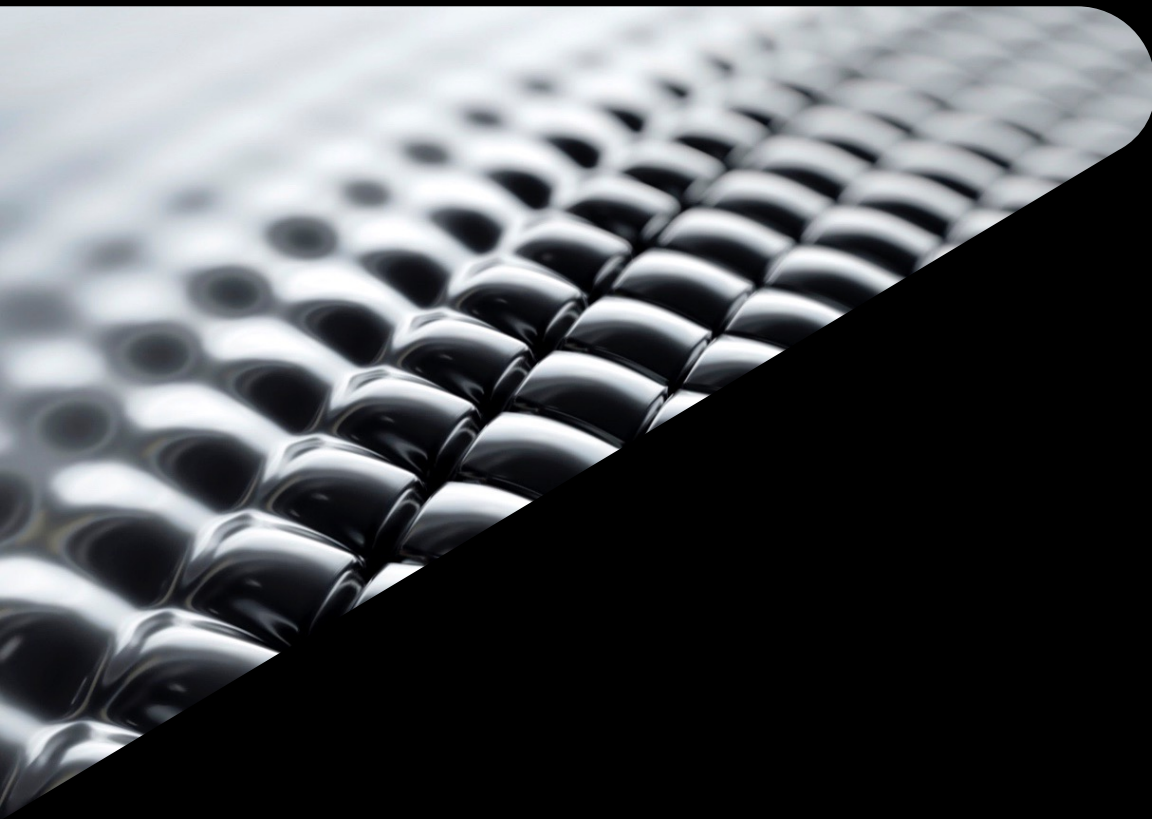


**Justin Taylor**  
London  
EMEA



**Carol Battle**  
Melbourne  
APAC

Our mission is to  
**empower customers to harness data, automation, and insights**  
to improve the impact of design and make decisions.



**DESIGN**



# Design is key to addressing total carbon emissions

Embodied Energy / Carbon



**RESOURCE  
EXTRACTION**



**PROCESSING  
MANUFACTURING**



**TRANSPORT**



**CONSTRUCTION**



Operational Energy / Carbon



**ELECTRICITY**



**NATURAL  
GAS**

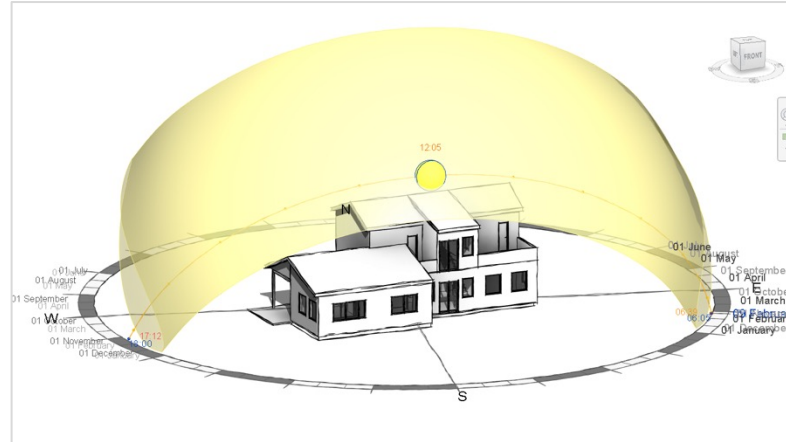


**OIL**



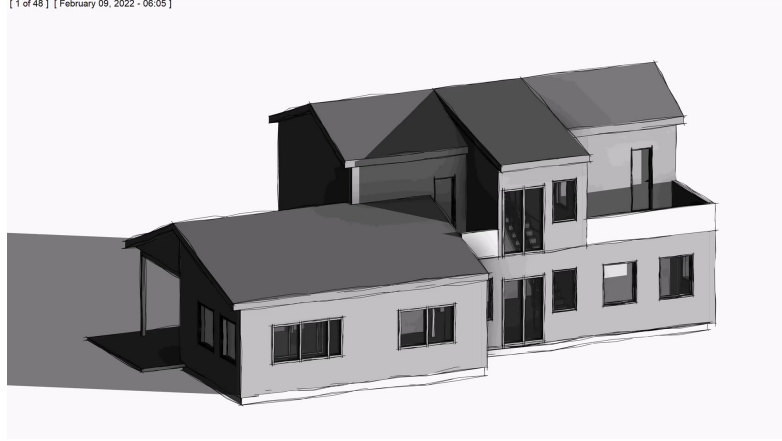
**RENEWABLES**

# Design to use less operational energy

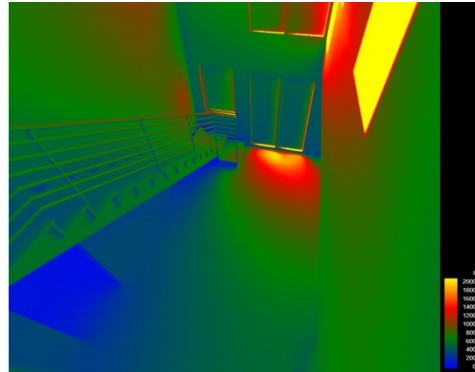


# Design to use less operational energy

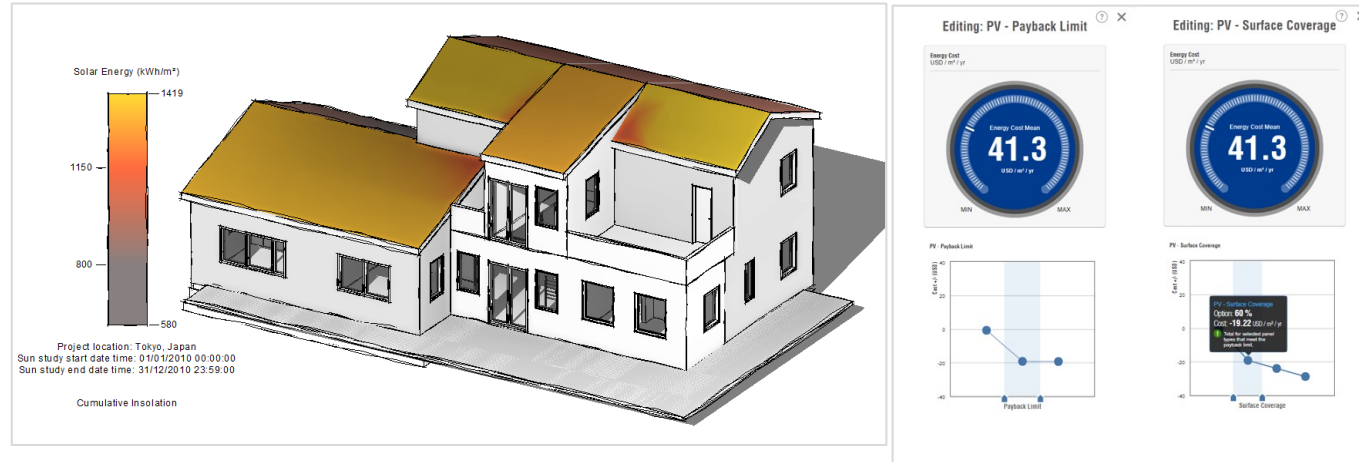
[ 1 of 48 ] [ February 09, 2022 - 06:05 ]



[ 1 of 43 ] [ February 09, 2022 - 06:39 ]



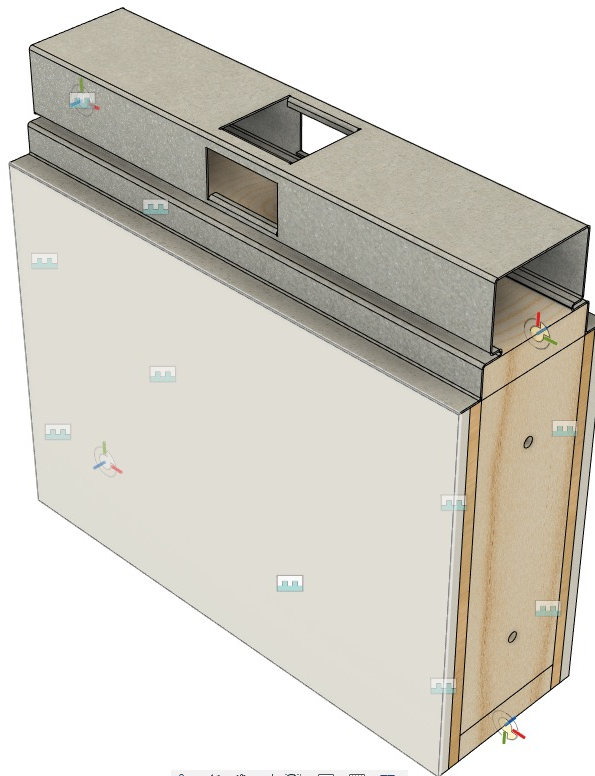
# Design to use less operational energy



The screenshot displays the Autodesk Fusion 360 software interface. On the left, the 'My Recent Data' panel lists several recent projects, including 'Lintel - 515 mm', 'Lintel - 490', 'EXPSG-120-100W', 'Lintel - 600 mm', '@Host3', '@Host', 'PIR Insulation - 600mm Lintel', 'Upper Tray - 490 mm', 'Panel - 600 mm', 'Nesting.Test', and 'Upper Tray Junction'. The main workspace shows a 3D model of a cabinet assembly, with a list of components in the 'BROWSER' panel. The components include 'Document Settings', 'Named Views', 'Origin', 'Analysis', 'Joints', 'Frame:1', 'Plywood:1', 'Plasterboards:1', and several bolts of different sizes (12x7 mm V2:8 to V2:15). The 'Upper Tray - 515 mm v8:1' is highlighted. The bottom of the interface shows a 'COMMENTS' panel and a toolbar with various modeling tools.

# Use better materials

## Autodesk Fusion & Makersite Integrations



Model courtesy of: Paolo Galli



The screenshot displays the Autodesk Fusion 360 software interface. On the left, the 'My Recent Data' panel lists several recent files, including 'Lintel - 515 mm', 'Lintel - 490', 'EXPSG-120-100W', 'Lintel - 600 mm', '@Host3', '@Host', 'PIR Insulation - 600mm Lintel', 'Upper Tray - 490 mm', 'Panel - 600 mm', 'Nesting.Test', and 'Upper Tray Junction'. The main workspace shows a 3D model of a cabinet assembly, with a list of components in the 'BROWSER' panel. The components include 'Document Settings', 'Named Views', 'Origin', 'Analysis', 'Joints', 'Frame:1', 'Plywood:1', 'Plasterboards:1', and several bolts of different sizes (12x7 mm V2:8 to V2:15). The 'CONNECT' button is highlighted in the top toolbar. The bottom status bar shows the 'COMMENTS' tab.

DESIGN

CONNECT

BROWSER

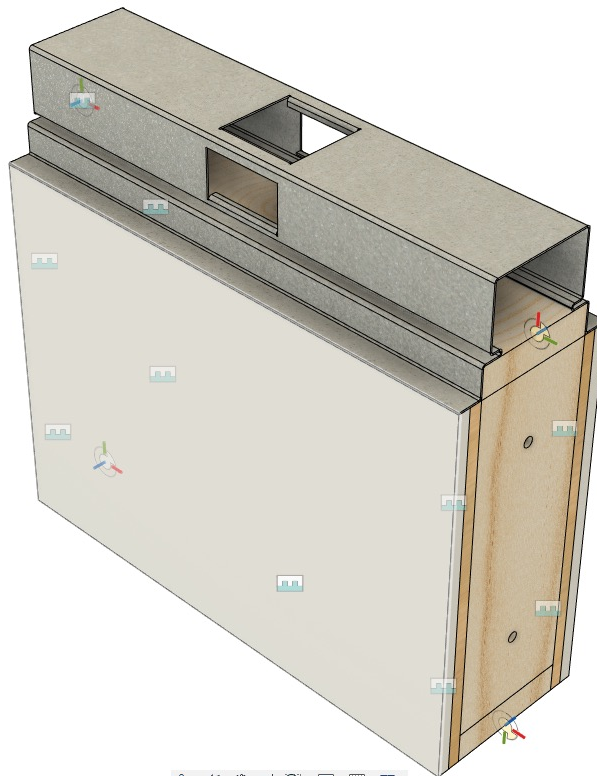
Lintel - 515 mm v4

- Document Settings
- Named Views
- Origin
- Analysis
- Joints
- Frame:1
- Plywood:1
- Plasterboards:1
- Bolt - 12x7 mm V2:8
- Bolt - 12x7 mm V2:9
- Bolt - 12x7 mm V2:10
- Bolt - 12x7 mm V2:11
- Bolt - 12x7 mm V2:12
- Bolt - 12x7 mm V2:13
- Bolt - 12x7 mm V2:14
- Bolt - 12x7 mm V2:15
- Upper Tray - 515 mm v8:1

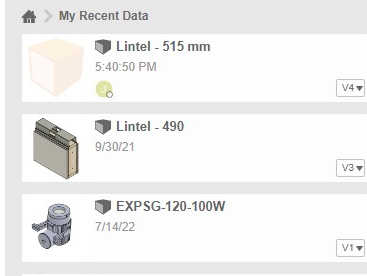
COMMENTS

# Use better materials

## Autodesk Fusion & Makersite Integrations



Model courtesy of: Paolo Galli



Autodesk-Makersite BOM assessment (v1.0.0.8)

Send BOM

Environment Calculation Costing Product Recommendation

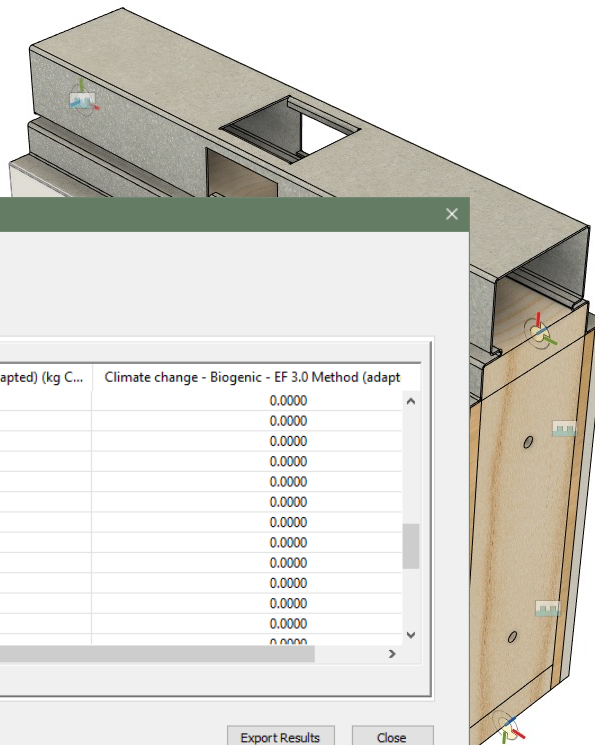
Name	Mass	Mass Unit	Climate change - EF 3.0 Method (adapted) (kg C...	Climate change - Biogenic - EF 3.0 Method (adapt
Steel (low-alloyed)	0.0127	kg	0.0169	0.0000
Bolt - 12x7 mm v2	0.0134	kg	0.0179	0.0000
Body2	0.0008	kg	0.0010	0.0000
Steel (low-alloyed)	0.0008	kg	0.0010	0.0000
Body1	0.0127	kg	0.0169	0.0000
Steel (low-alloyed)	0.0127	kg	0.0169	0.0000
Bolt - 12x7 mm v2	0.0134	kg	0.0179	0.0000
Body2	0.0008	kg	0.0010	0.0000
Steel (low-alloyed)	0.0008	kg	0.0010	0.0000
Body1	0.0127	kg	0.0169	0.0000
Steel (low-alloyed)	0.0127	kg	0.0169	0.0000
Bolt - 12x7 mm v2	0.0134	kg	0.0179	0.0000
Body2	0.0008	kg	0.0010	0.0000

Export Results

Close

# Use better materials

## Autodesk Fusion & Makersite Integrations



Model courtesy of: Paolo Galli

My Recent Data

Lintel - 515 mm  
5:40:50 PM

V4

Lintel - 490  
9/30/21

V3

EXPSG-120-100W  
7/14/22

V1



Lintel - 515 mm



9/28/21

V13

DESIGN

SOLID

SURFACE

MESH

SHEET



CONNECT

BROWSER

Lintel - 515 mm v4

Document Settings

Named Views

Origin

Analysis

Joints

Frame:1

Plywood:1

Plasterboards:1

Autodesk-Makersite BOM assessment (v1.0.0.8)

Send BOM

Environment Calculation Costing Product Recommendation

Name	Should Cost (Dollars)	Material costs (Dollars)	Manufacturing Costs (Dollars)
Steel	0.0260	0.0110	0.0130
Steel (low-alloyed)	0.0250	0.0100	0.0130
Steel	0.0016	0.0007	0.0008
Steel (low-alloyed)	0.0015	0.0006	0.0008
steel, low-alloyed	0.0015	0.0006	0.0008
Lintel - 515 mm v3_Bolt - 12x7 mm v2	0.0280	0.0120	0.0150
Lintel - 515 mm v3_Bolt - 12x7 mm...	0.0260	0.0110	0.0130
Lintel - 515 mm v3_Bolt - 12x7 mm...	0.0016	0.0007	0.0008
Lintel - 515 mm v3_Bolt - 12x7 mm v2	0.0280	0.0120	0.0150
Lintel - 515 mm v3_Bolt - 12x7 mm...	0.0260	0.0110	0.0130
Lintel - 515 mm v3_Bolt - 12x7 mm...	0.0016	0.0007	0.0008
Lintel - 515 mm v3_Plywood	0.0000	0.0000	0.0000
Lintel - 515 mm v3_Plywood_Ext...	0.0000	0.0000	0.0000
Lintel - 515 mm v3_Plywood_Ext...	0.0000	0.0000	0.0000

Export Results

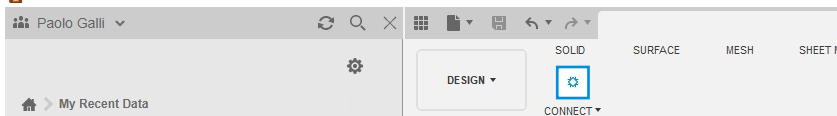
Close

COMMENTS

# Use better materials

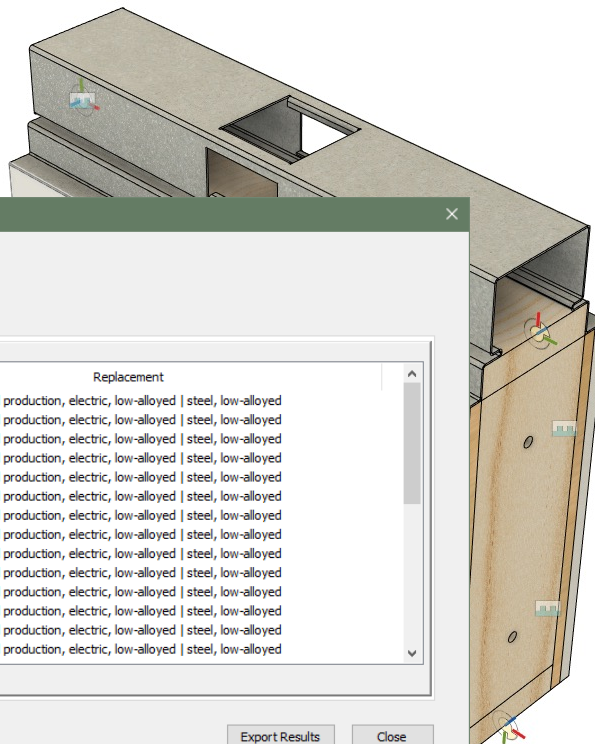
## Autodesk Fusion & Makersite Integrations





# Use better materials

## Autodesk Fusion & Makersite Integrations



Autodesk-Makersite BOM assessment (v1.0.0.8)

Send BOM

Environment Calculation Costing Product Recommendation

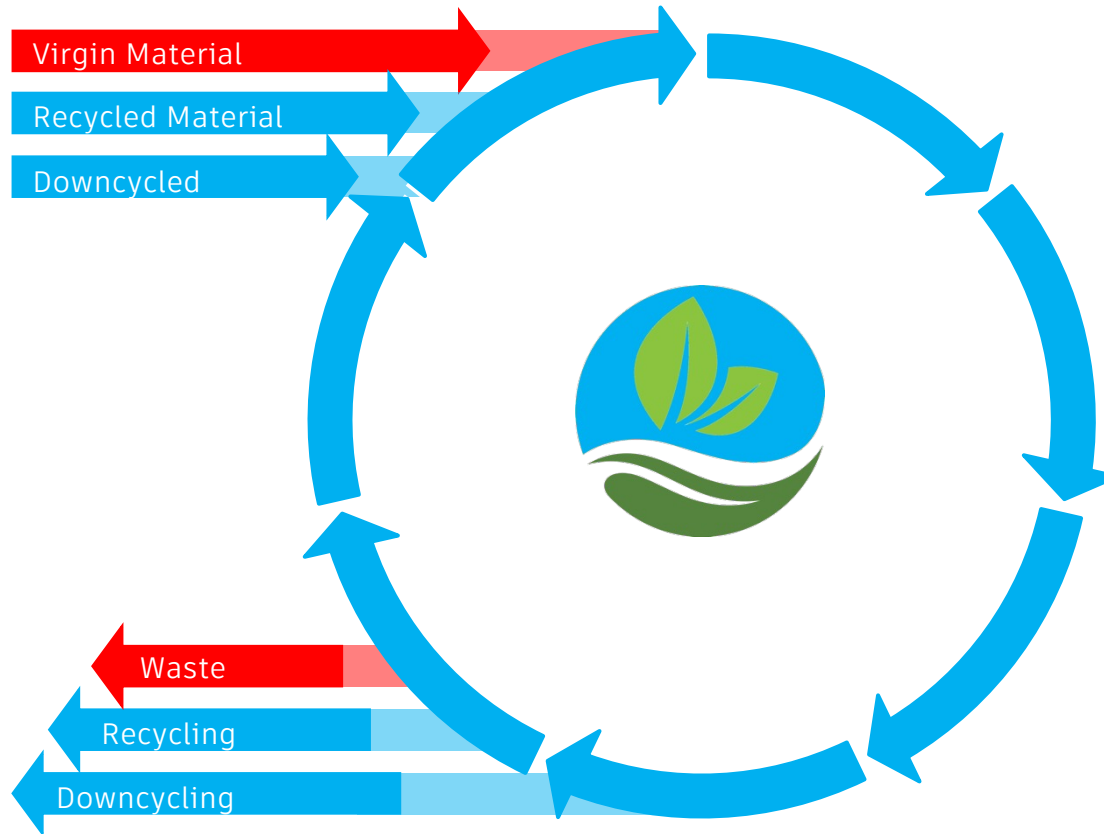
Name	Savings (% CO2 emission)	Replacement
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	69.3	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	69.3	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	64.67	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	64.67	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	55.16	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	55.16	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	42.38	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	42.38	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	21.61	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Upper Tray - 515 mm v8_Body1 (S...	21.61	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Bolt - 12x7 mm v2_Body1 (Steel (L...	0.35	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Bolt - 12x7 mm v2_Body1 (Steel (L...	0.35	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Bolt - 12x7 mm v2_Body1 (Steel (L...	0.33	steel production, electric, low-alloyed   steel, low-alloyed
Lintel - 515 mm v3_Bolt - 12x7 mm v2_Body1 (Steel (L...	0.33	steel production, electric, low-alloyed   steel, low-alloyed

Export Results

Close

Model courtesy of: Paolo Galli

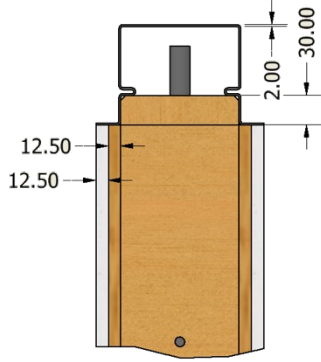
# Close the material loop to further reduce impact





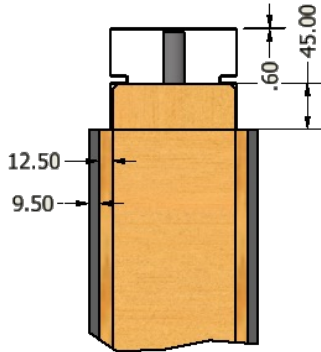
# Expect to reuse

## Data-driven decisions for circularity



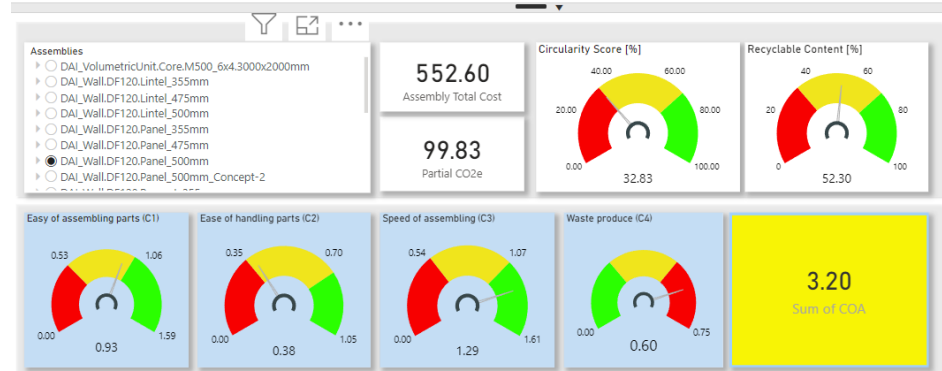
### Baseline Design

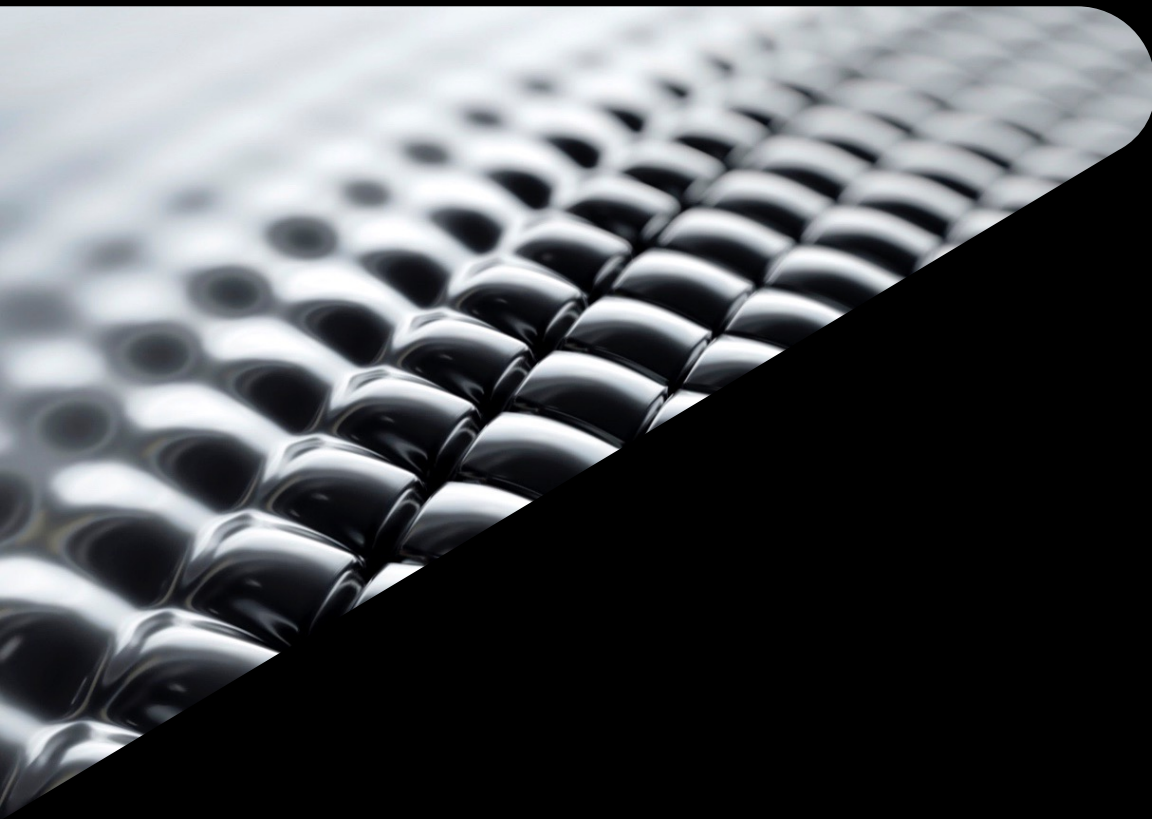
12.5mm Plyboard  
12.5mm Plasterboard  
120 x 30mm Batten  
2mm Sheet Steel



### Proposed Design

12.5mm Plyboard  
9.5mm Fiberboard  
120 x 40mm Batten  
0.6mm Sheet Steel

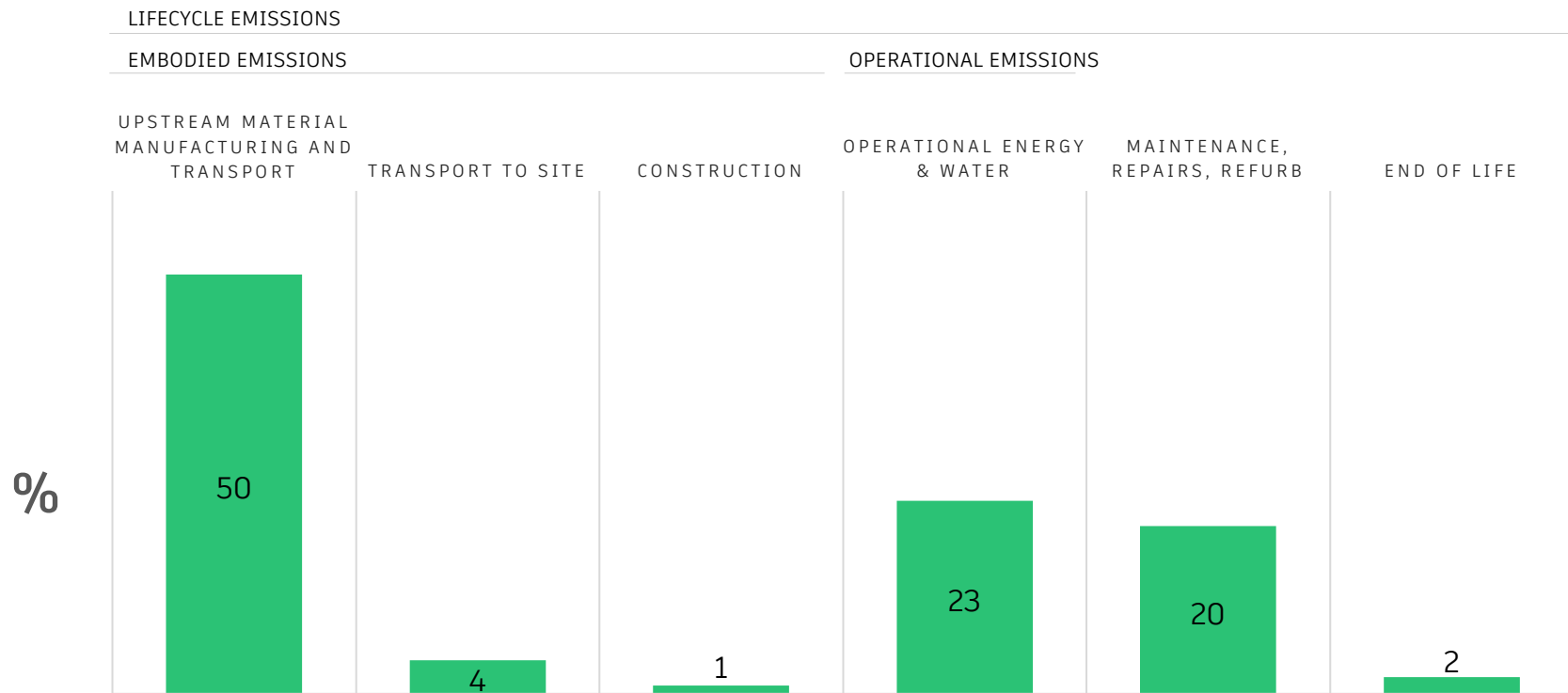




**BUILD**

# Construction emissions in context

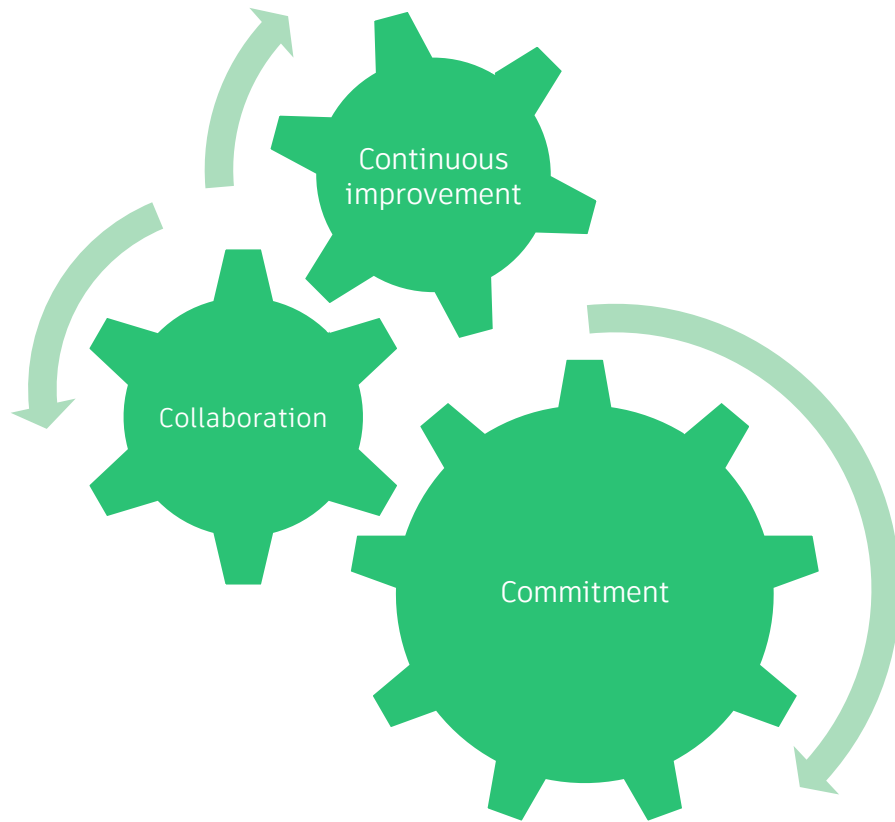
The construction phases that use the least and can influence the most



Based on International Cost Management  
Standard 3 framework (inc AIQS)

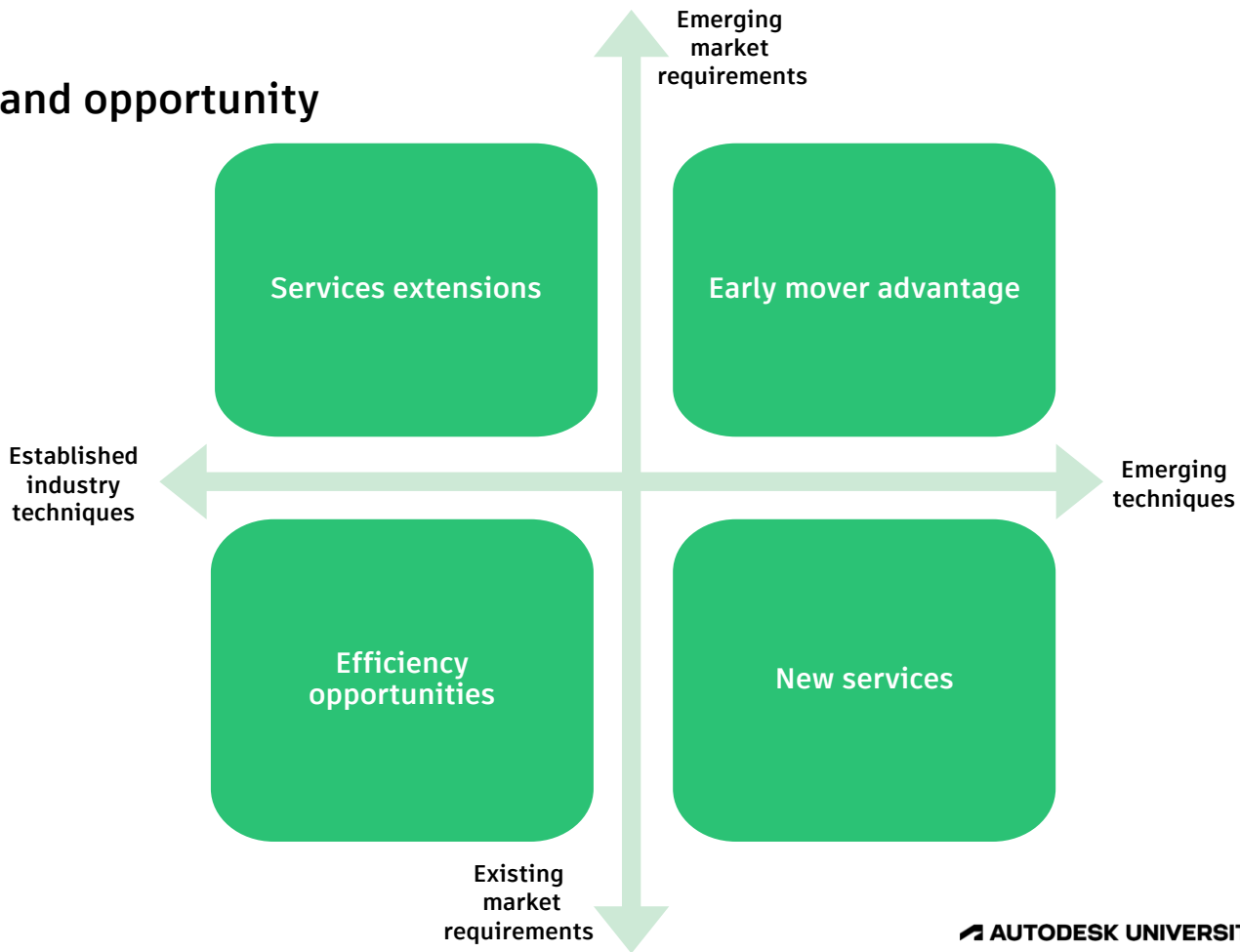
# Mindset

Integrated management and opportunity



# Mindset

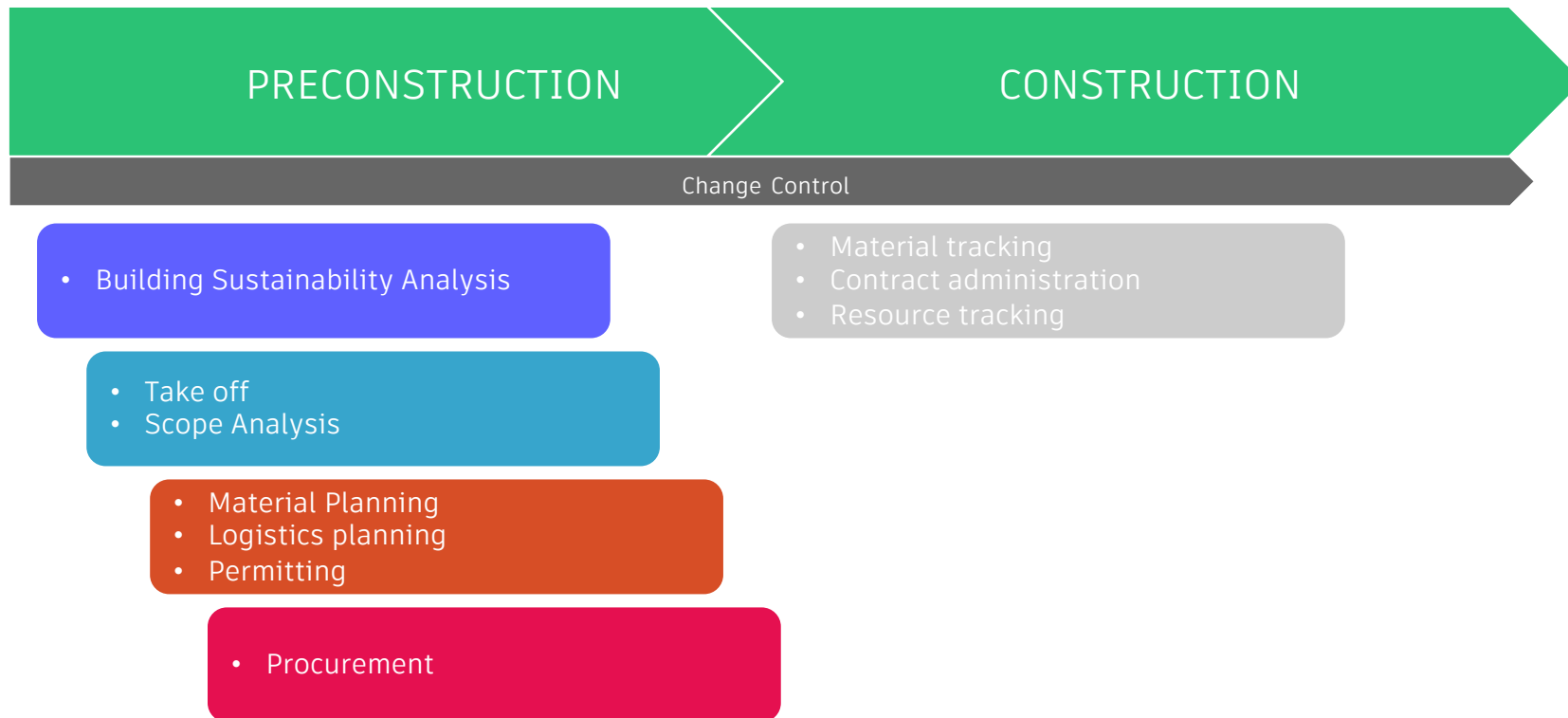
Integrated management and opportunity





# Skillsets

Effective carbon management integrates requirements into existing workflows



# Toolsets

**Waste Audit Statement**

Form date: 7/1/2022

Location: Site Works

Description:

Assigned to: Justin Taylor

Waste Audit Statement Template

Construction and Demolition Phase	
1. Has the development been designed to minimise waste production?	
2. What are the amounts of each type of demolition waste? (tonnes) (where relevant)	
3. What is the amount of construction waste? (including volume of packaging) (tonnes)	
4. What provision has been made for on-site re-use of materials wherever possible, including the re-use of demolition waste, where possible in foundations, access roads and paths?	
5. Have any necessary consents required from the Environment Agency or Local Authority been sought for the management of wastes on site?	
6. Has suitable provision been made for 'house waste' arising on site?	

Track construction waste and automate certification documentation with custom templates in Build

**2. Air Quality**

2.1 Minimize dust from materials by using covers, storage, control equipment and increasing moisture content.

☐ Yes ☐ No ☐ NA

2.2 Minimize dust from vehicle movements, using water sprays if appropriate.

☐ Yes ☐ No ☐ NA

2.3 Avoid burning of materials on site.

☐ Yes ☐ No ☐ NA

**3. Water - Run-off Management**

3.1 Prepare a drainage plan and mark manholes or water entry points to highlight risk areas: Note This plan may change as the works progress.

☐ Yes ☐ No ☐ NA

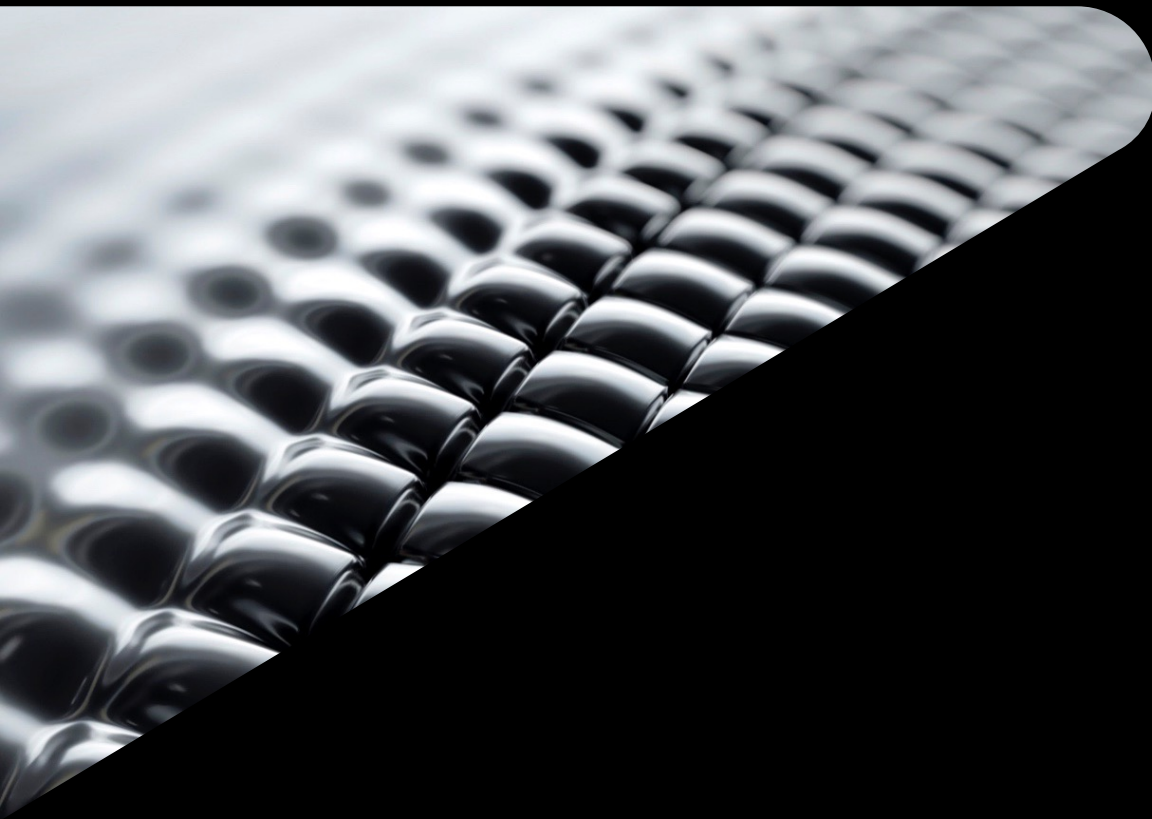
3.2 Where possible or appropriate, schedule works to avoid heavy rainfall periods (i.e. during the dry season) and modify activities during extreme rainfall and high winds.

☐ Yes ☐ No ☐ NA

Track air quality onsite with Build questionnaires



Generative design to minimize number of trips



**OPERATE &  
MAINTAIN**

# **Why does it matter?**

AEC represents ~40% of global GHG emissions.

# Why does it matter?



AEC represents ~40% of global GHG emissions.

Global building energy use needs to reduce by 30% by 2030 to meet Paris Agreement targets.

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~67% of the global building area that exists today will still exist in 2040.

AEC represents ~40% of global GHG emissions.

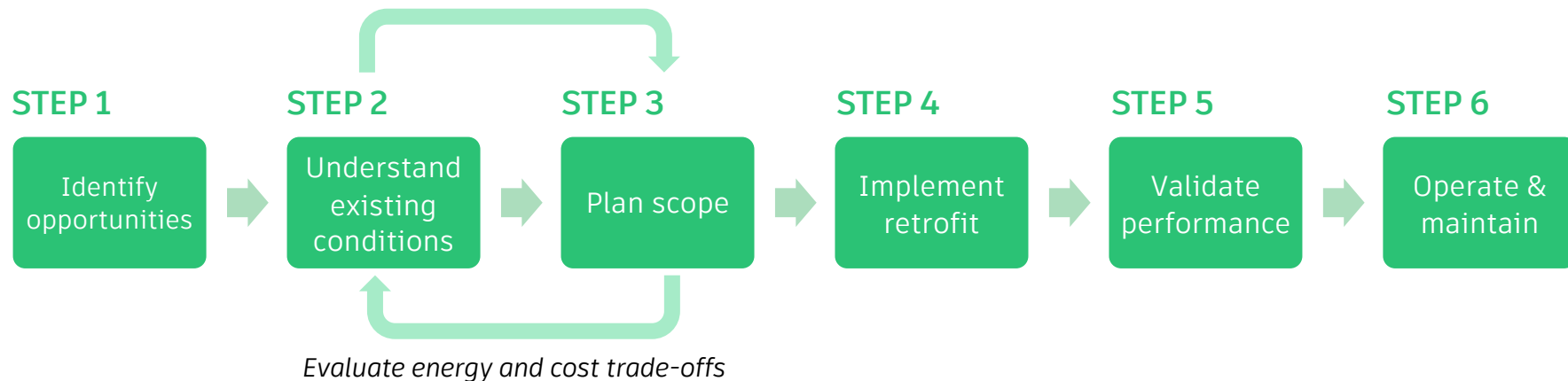
Global building energy use needs to reduce by 30% by 2030 to meet Paris Agreement targets.

# Why does it matter?

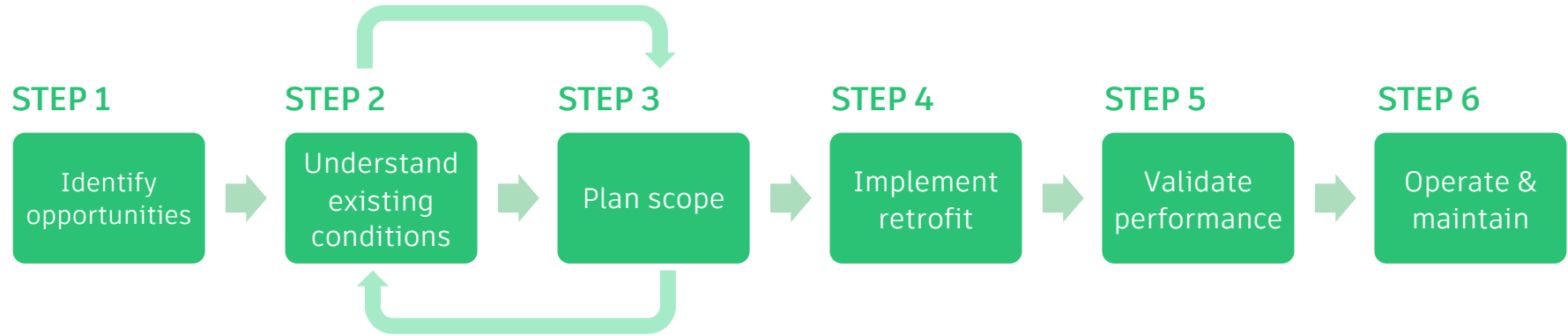
~67% of the global building area that exists today will still exist in 2040.

**We can't meet targets without addressing existing buildings!**

# **\*Simplified\* Retrofit Process Overview**



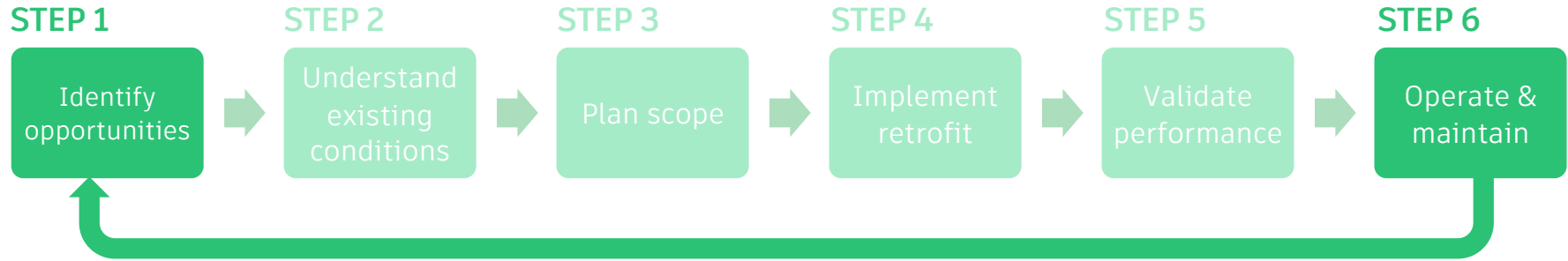
# **\*Simplified\* Retrofit Process Overview**



*Evaluate energy and cost trade-offs*

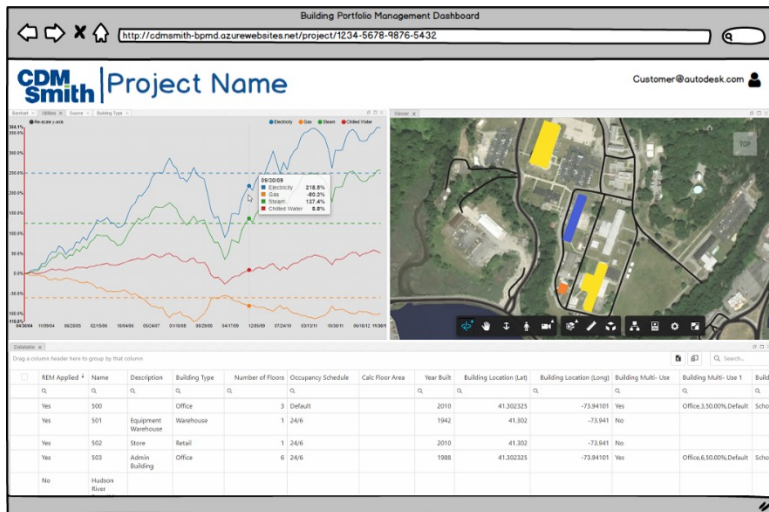


# Digital Twins can create a link between O&M and opportunities for continued performance

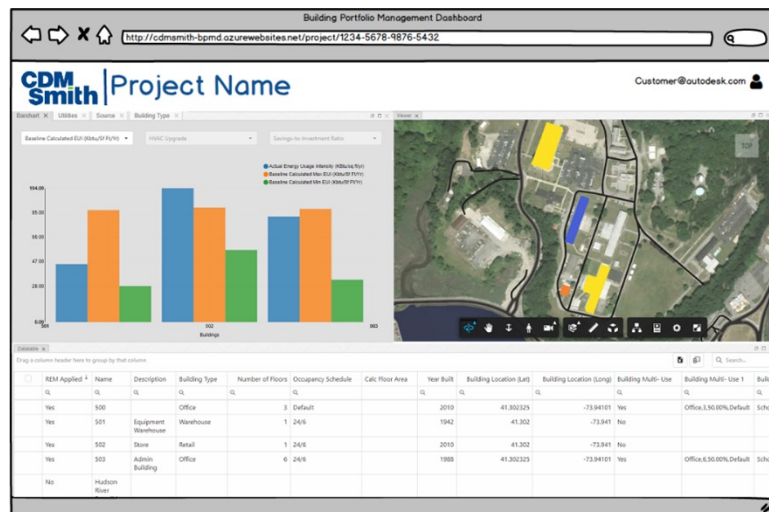


# Portfolio Management Solutions

## Rapid Energy Modeling tool



Actual utility usage



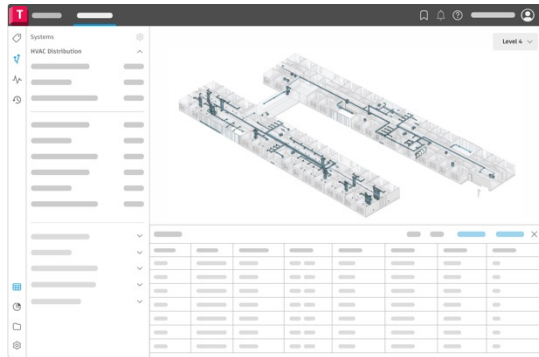
Actual EUI vs calculated min/max EUI



# Tandem for Owners & Operators

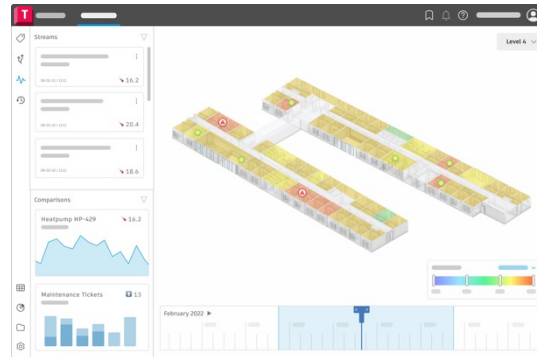
Now

## Twin Building Descriptive Twin



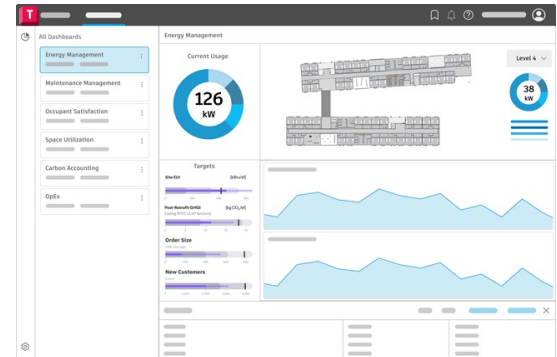
Next

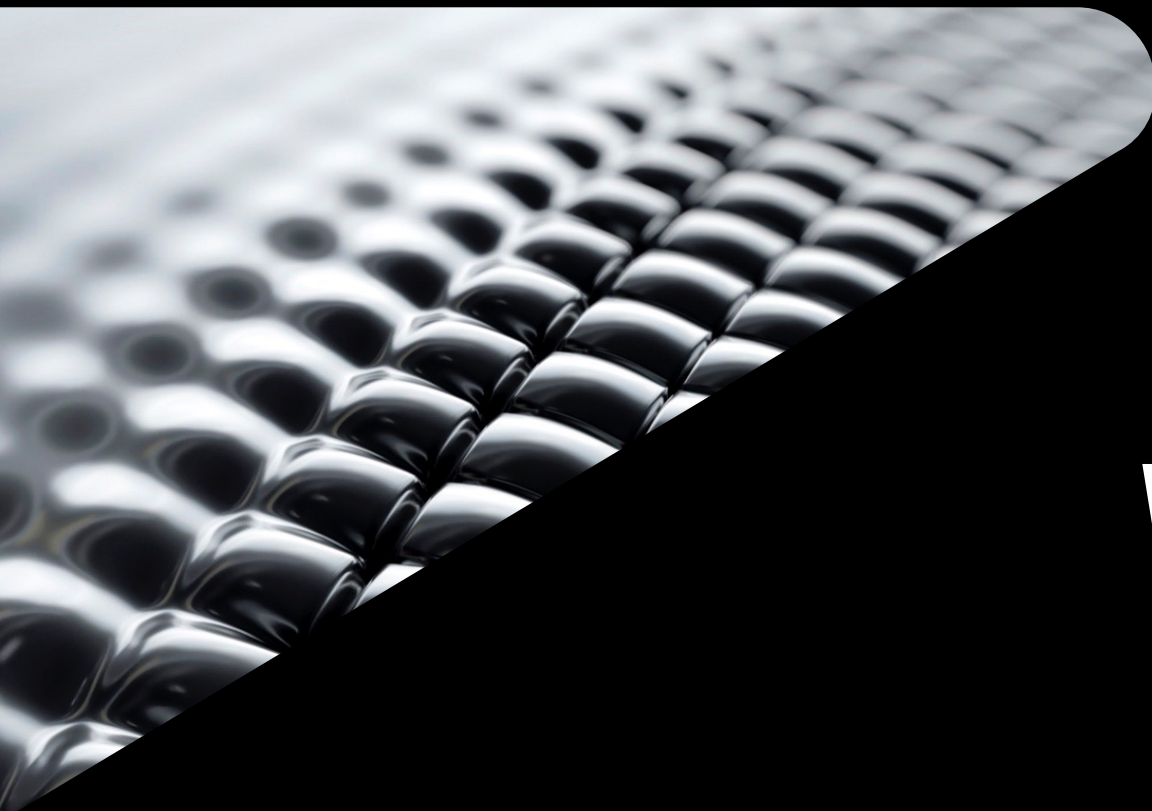
## Facility Monitoring Informative Twin



Later

## Portfolio Optimizing Predictive Twin





**Work With Us**

# Partnering for Impact

## Sustainability Solutions & Services

- Embodied carbon for buildings and infrastructure
- Construction sustainability management
- Generative design for building material efficiency
- Existing building retrofit carbon analysis
- Digital twin for building & factory operations



**Q & A**



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