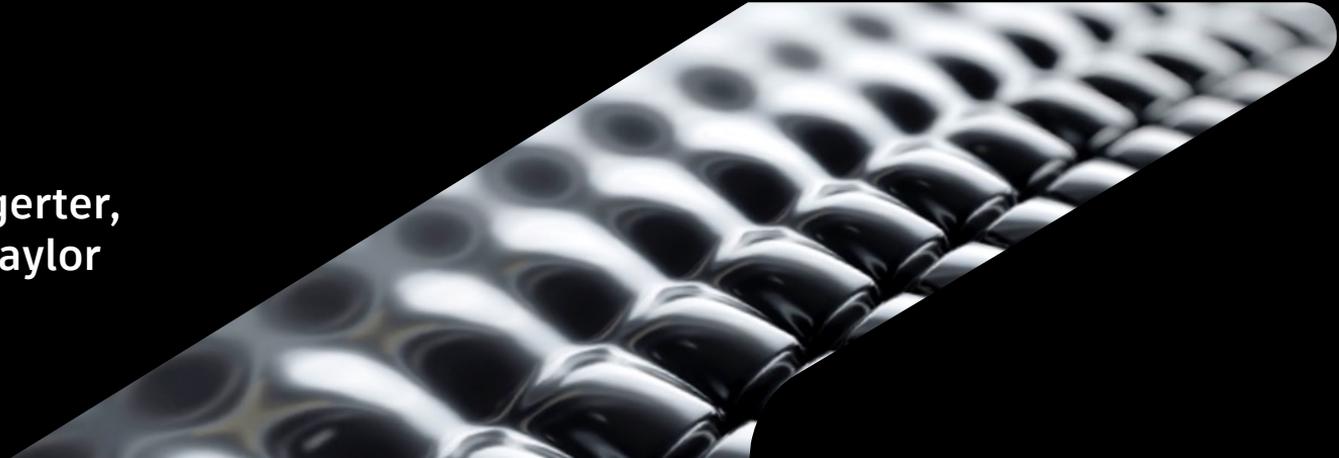




Greenwashing? Not here.

Autodesk's New Sustainability Consulting Practice

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



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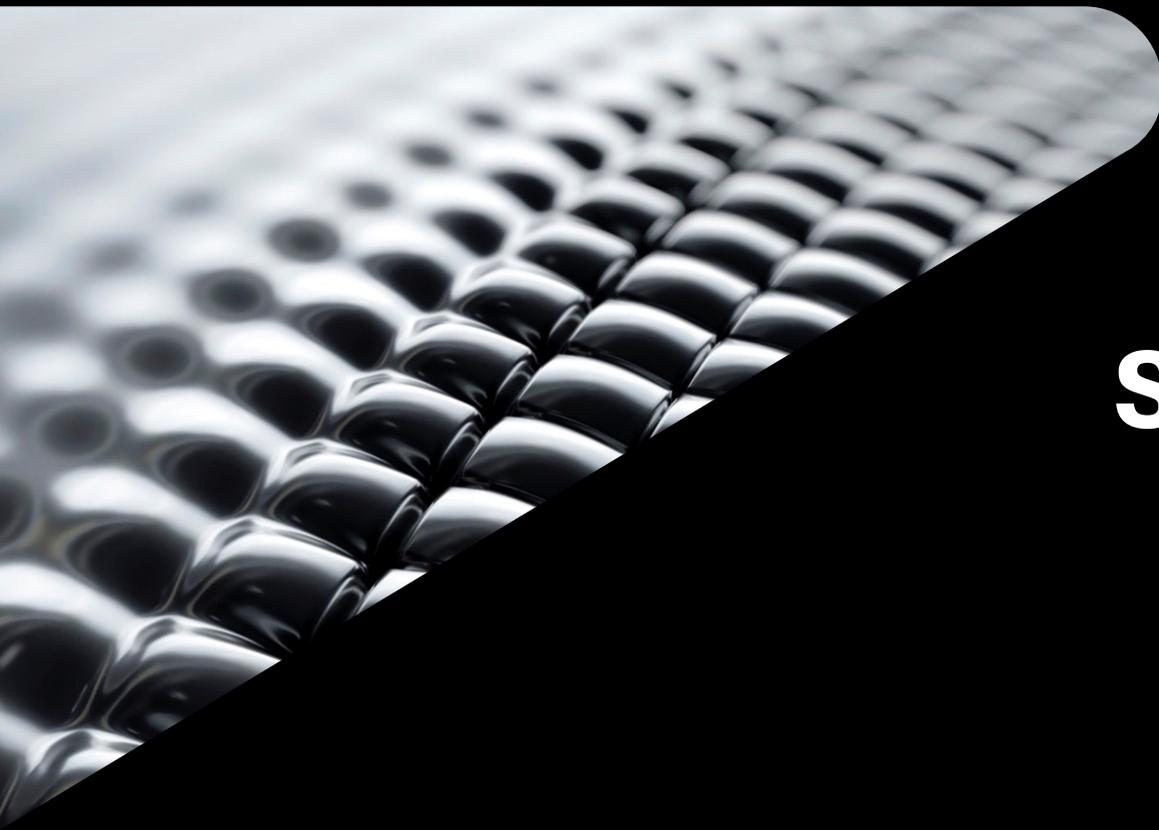
Agenda

- 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

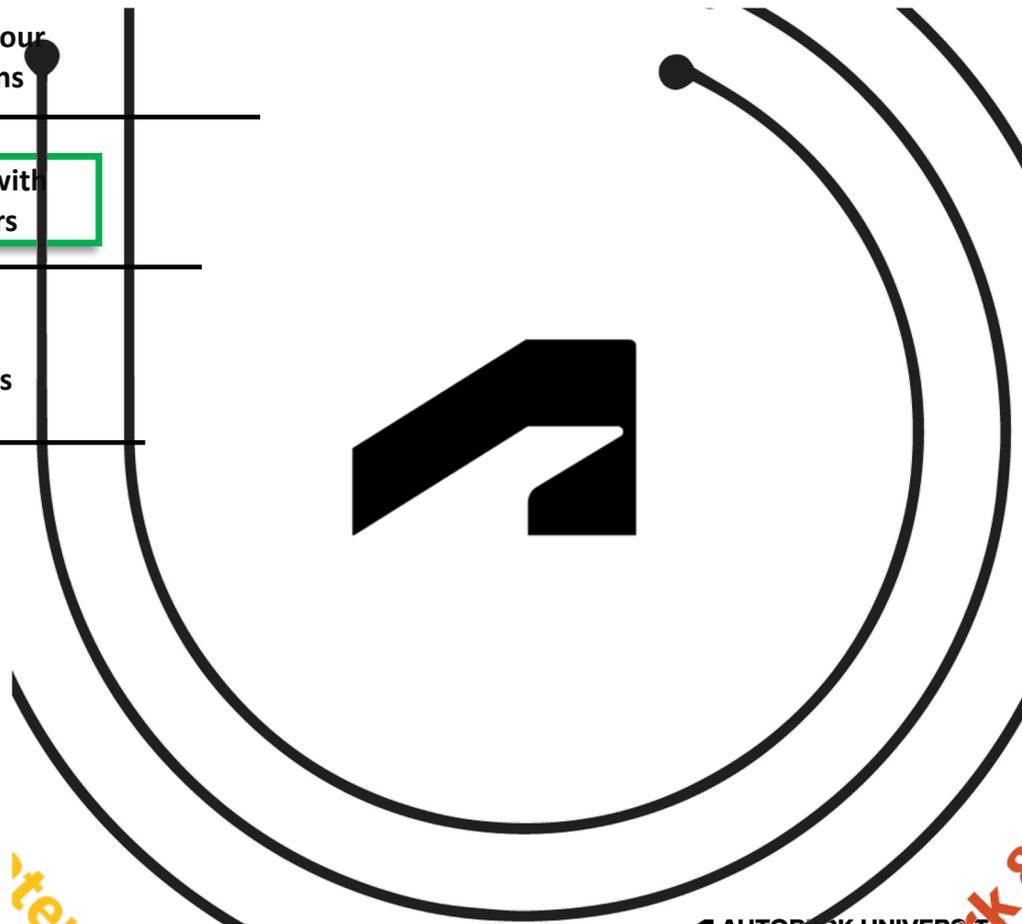
Improve our
operations

Partner with
customers

Advance
industries

THREE WAYS WE CREATE IMPACT

THREE IMPACT OPPORTUNITY
AREAS



te.

Autodesk's

Autodesk's Sustainability Consulting Practice



Jonathan Rowe
San Francisco
Global Lead



Amy Egerter
San Francisco
AMER

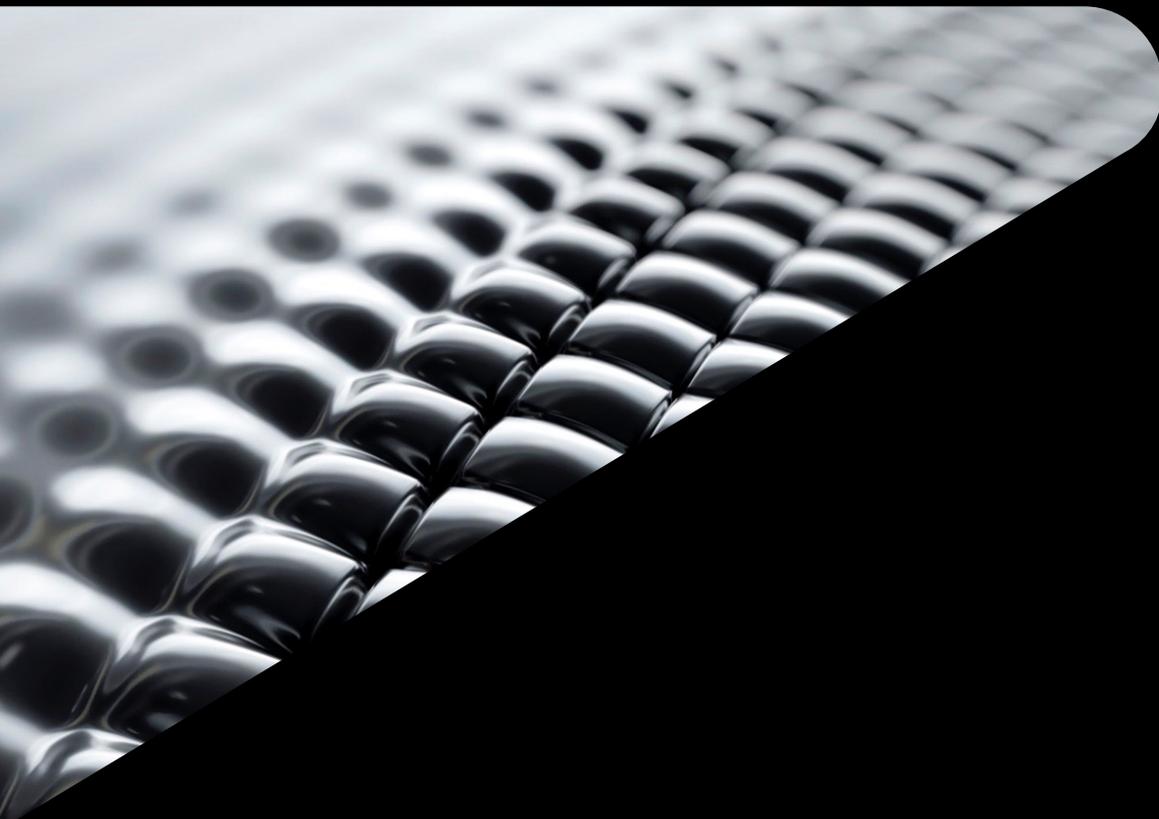


Justin Taylor
London
EMEA



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**

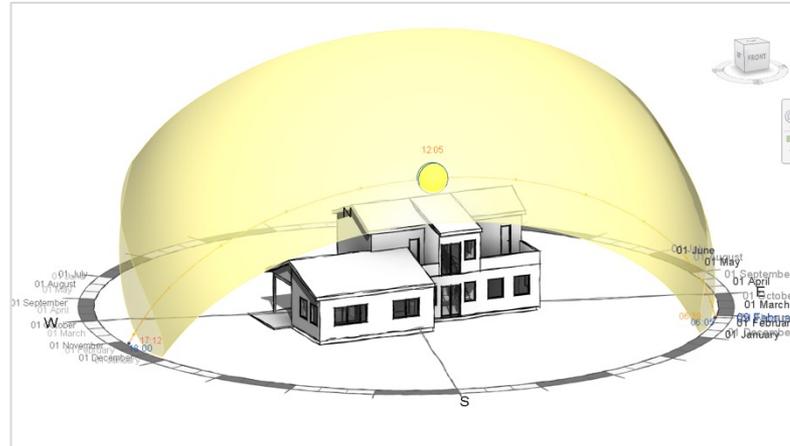


OIL



RENEWABLES

Design to use less operational energy

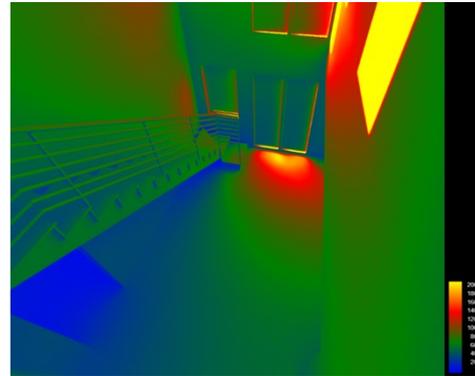


Design to use less operational energy

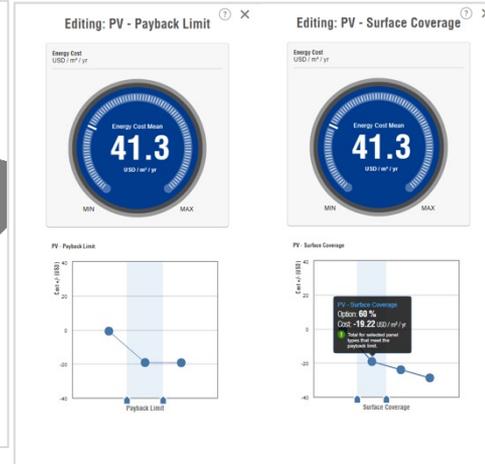
[1 of 48] [February 09, 2022 - 06:05]



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



Design to use less operational energy



My Recent Data

- Lintel - 515 mm
5:40:50 PM
- Lintel - 490
9/30/21
- EXPSG-120-100W
7/14/22
- Lintel - 600 mm
6/20/22
- @Host3
9/30/21
- @Host
9/15/21
- PIR Insulation - 600mm Lintel
6/20/22
- Upper Tray - 490 mm
9/28/21
- Panel - 600 mm
11/24/21
- Nesting_Test
2/9/22
- Upper Tray Junction
9/28/21

SOLID SURFACE MESH SHEET

DESIGN

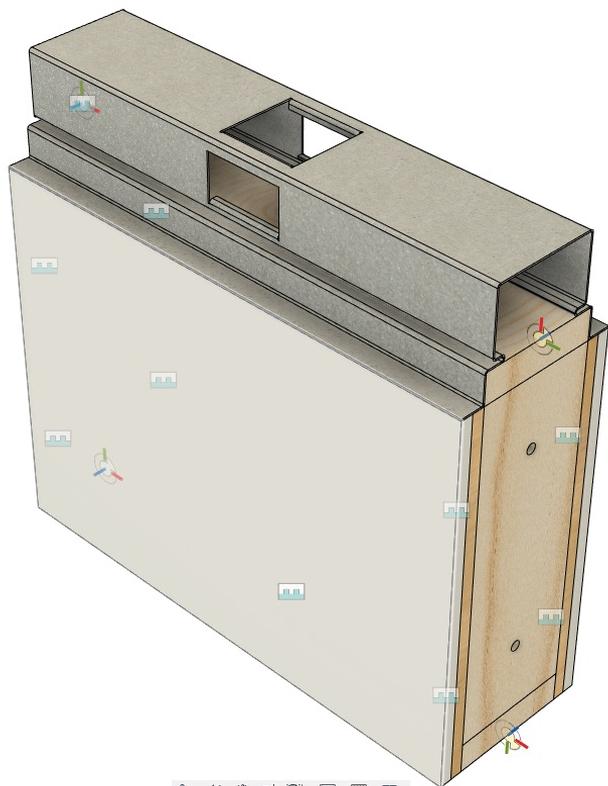
CONNECT

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

Use better materials

Autodesk Fusion & Makersite Integrations



Model courtesy of: Paolo Galli

COMMENTS

Navigation and tool icons for the CAD software interface.

My Recent Data

- Lintel - 515 mm
5:40:50 PM
- Lintel - 490
9/30/21
- EXPSG-120-100W
7/14/22
- Lintel - 600 mm
6/20/22
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9/28/21
- Panel - 600 mm
11/24/21
- Nesting_Test
2/9/22
- Upper Tray Junction
9/28/21

SOLID SURFACE MESH SHEET

DESIGN **CONNECT**

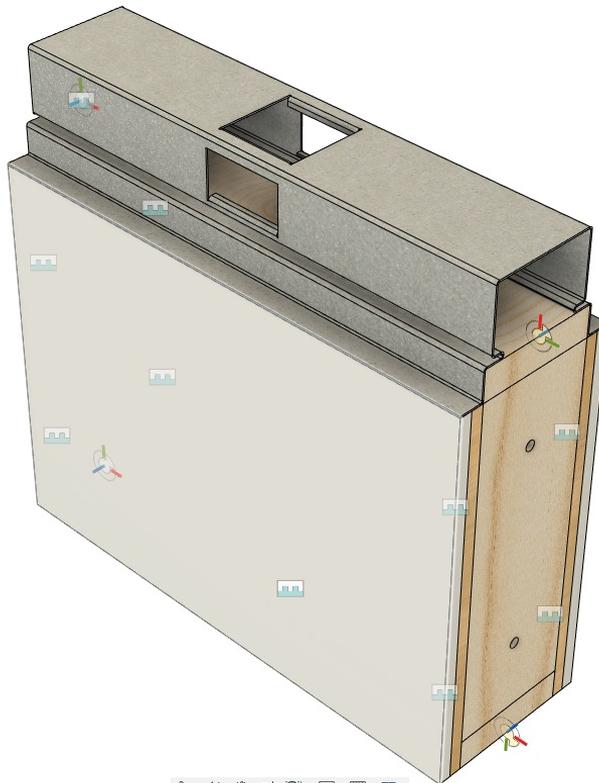
BROWSER

- 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



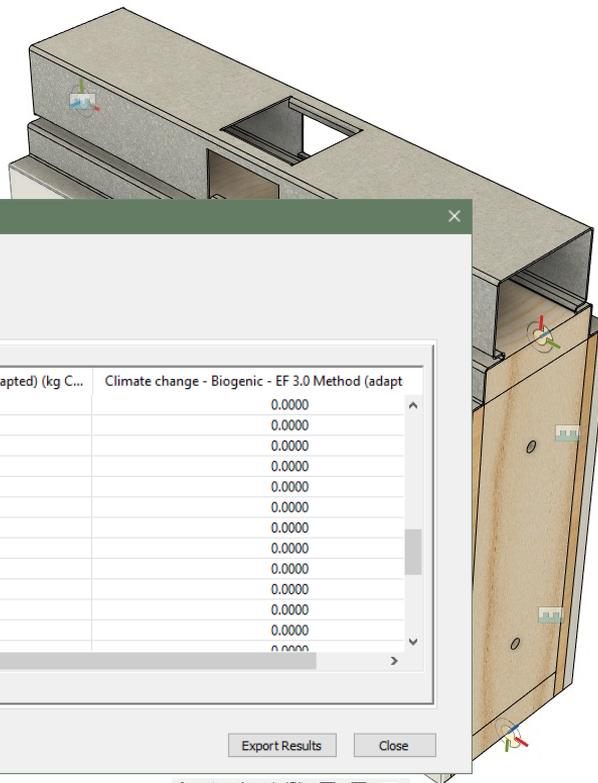
DESIGN **CONNECT**

BROWSER

- Lintel - 515 mm v4
- Document Settings
- Named Views
- Origin
- Analysis
- Joints
- Frame:1
- Plywood:1
- Plasterboards:1

Use better materials

Autodesk Fusion & Makersite Integrations



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

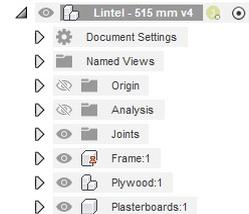
My Recent Data



SOLID SURFACE MESH SHEET

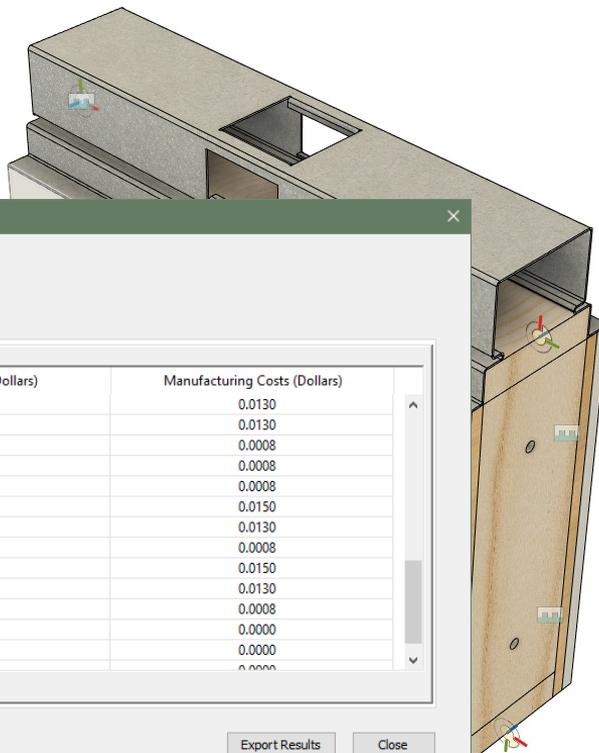
DESIGN **CONNECT**

BROWSER



Use better materials

Autodesk Fusion & Makersite Integrations



Autodesk-Makersite BOM assessment (v1.0.0.8)

Send BOM

Environment Calculation Costing Product Recommendation

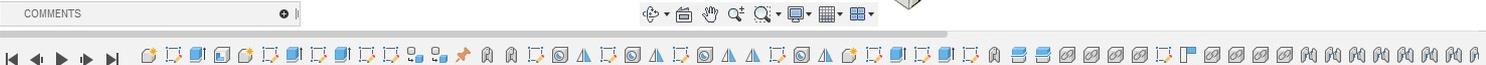
Name	Should Cost (Dollars)	Material costs (Dollars)	Manufacturing Costs (Dollars)
Steel	0.0260	0.0110	0.0130
Steel (low-alloyed)	0.0250	0.0100	0.0130
Steel	0.0016	0.0007	0.0008
Steel (low-alloyed)	0.0015	0.0006	0.0008
steel, low-alloyed	0.0015	0.0006	0.0008
Lintel - 515 mm v3_Bolt - 12x7 mm v2	0.0280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

Model courtesy of: Paolo Galli

COMMENTS



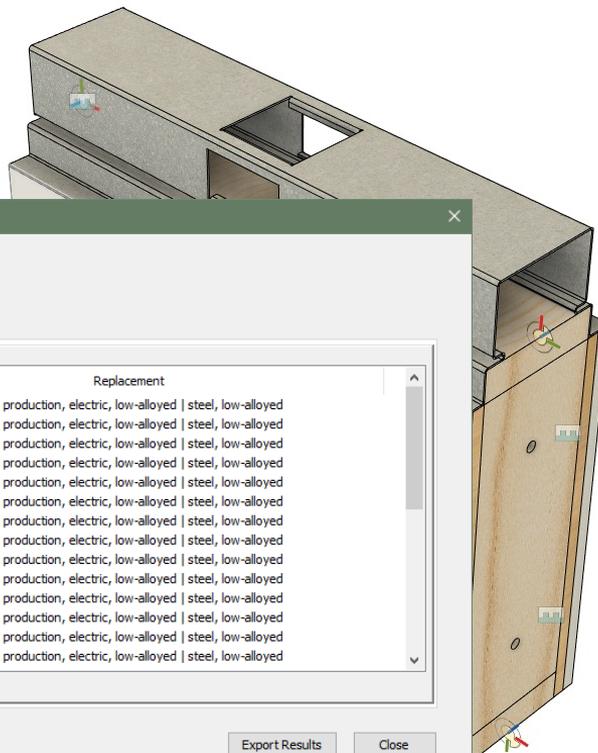
DESIGN **CONNECT**

BROWSER

- Lintel - 515 mm v4
 - Document Settings
 - Named Views
 - Origin
 - Analysis
 - Joints
 - Frame:1
 - Plywood:1
 - Plasterboards:1

Use better materials

Autodesk Fusion & Makersite Integrations



Autodesk-Makersite BOM assessment (v1.0.0.8)

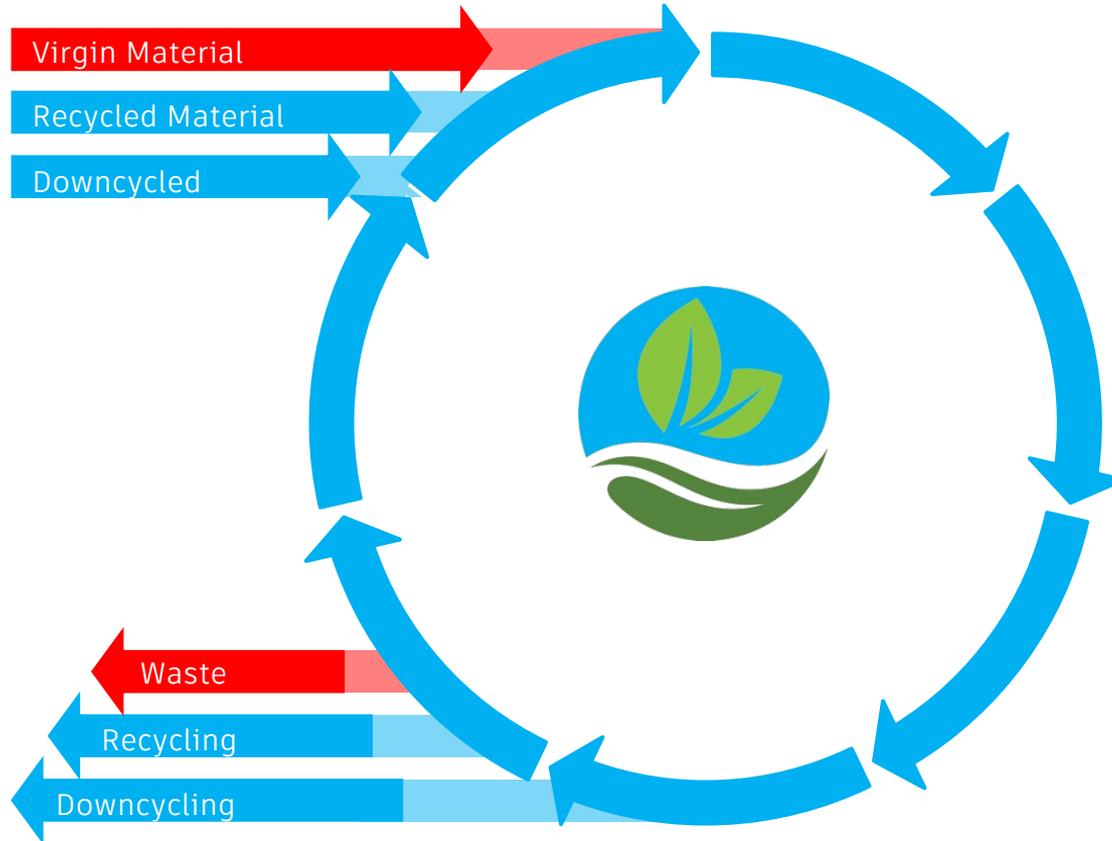
Send BOM

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

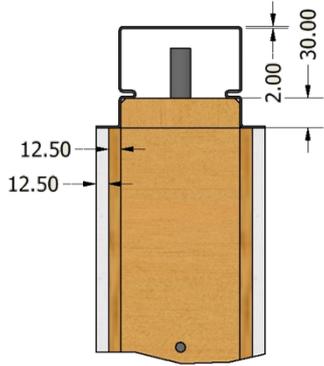
Export Results Close

Close the material loop to further reduce impact



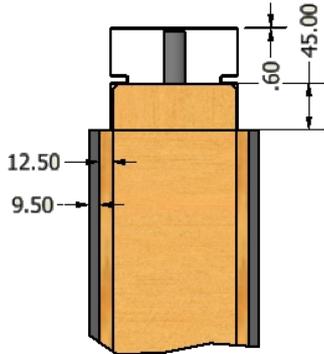
Expect to reuse

Data-driven decisions for circularity



Baseline Design

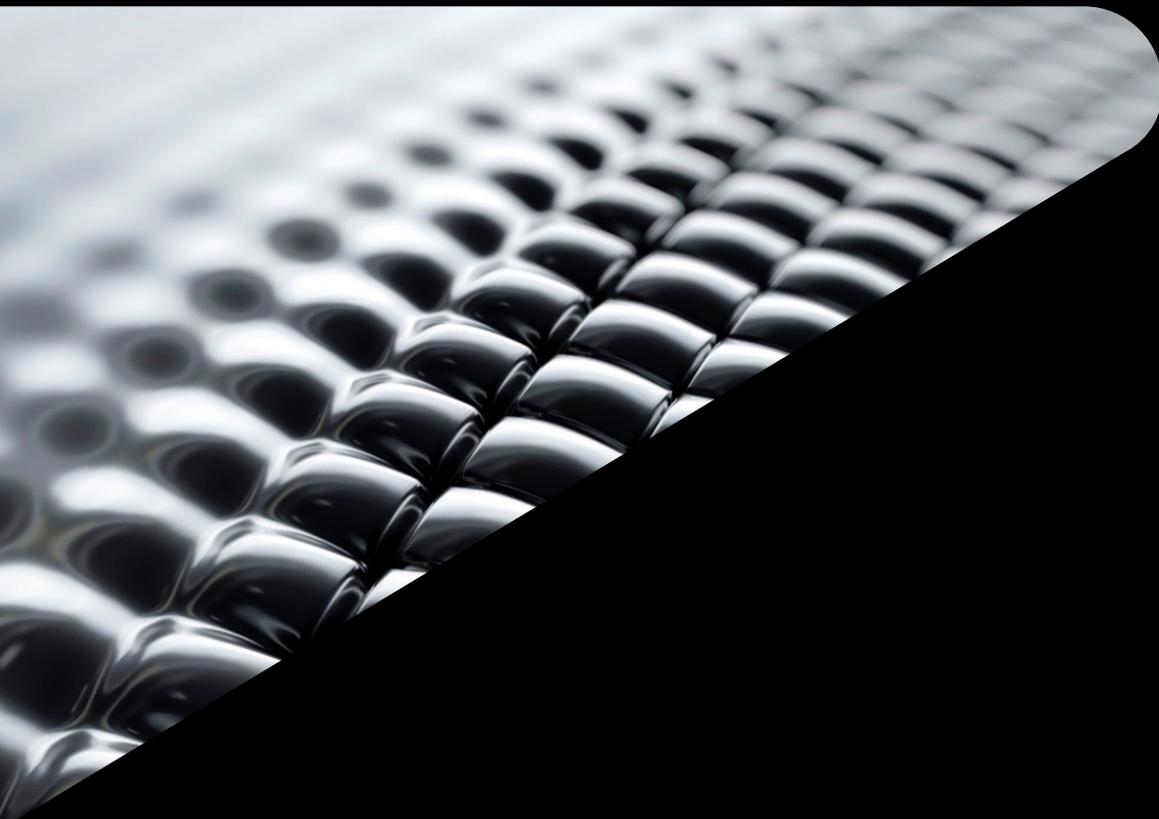
12.5mm Plyboard
12.5mm Plasterboard
120 x 30mm Batten
2mm Sheet Steel



Proposed Design

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

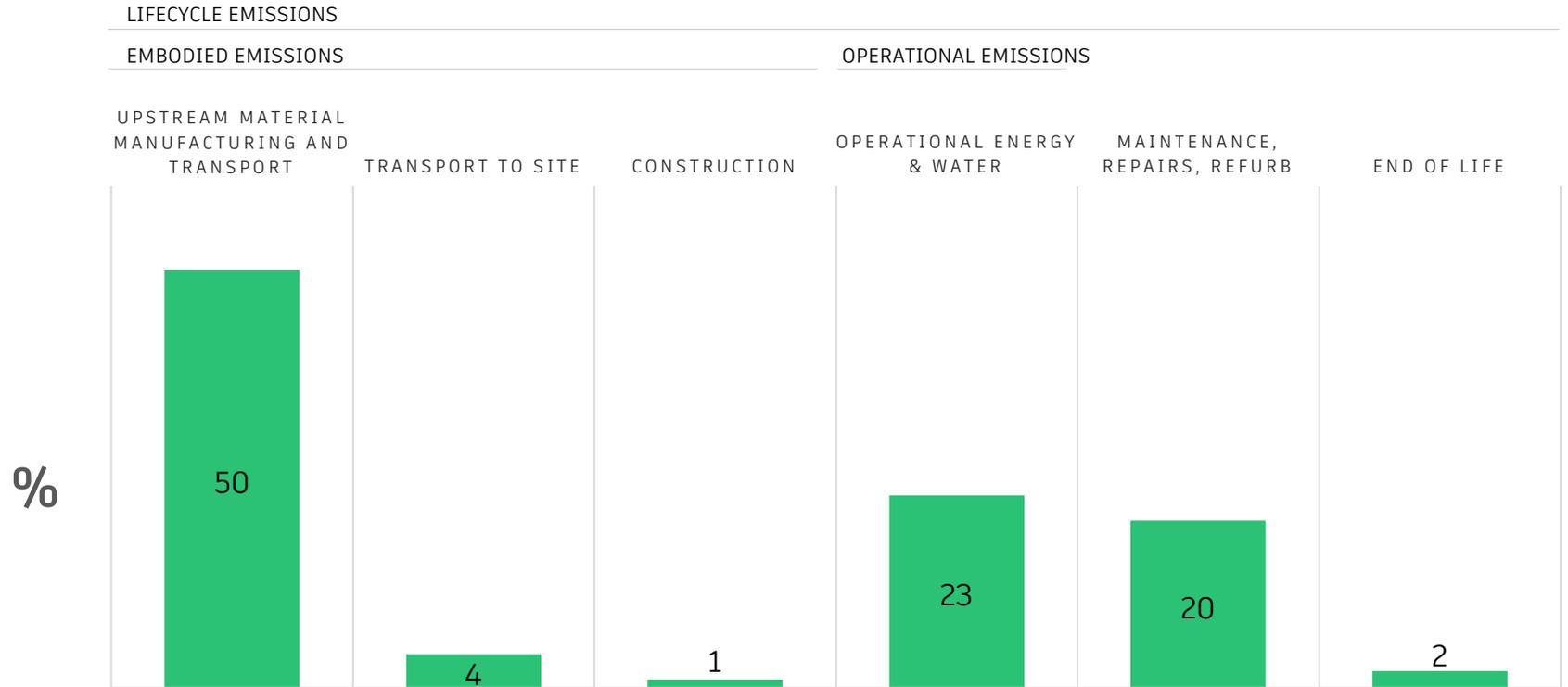




BUILD

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)

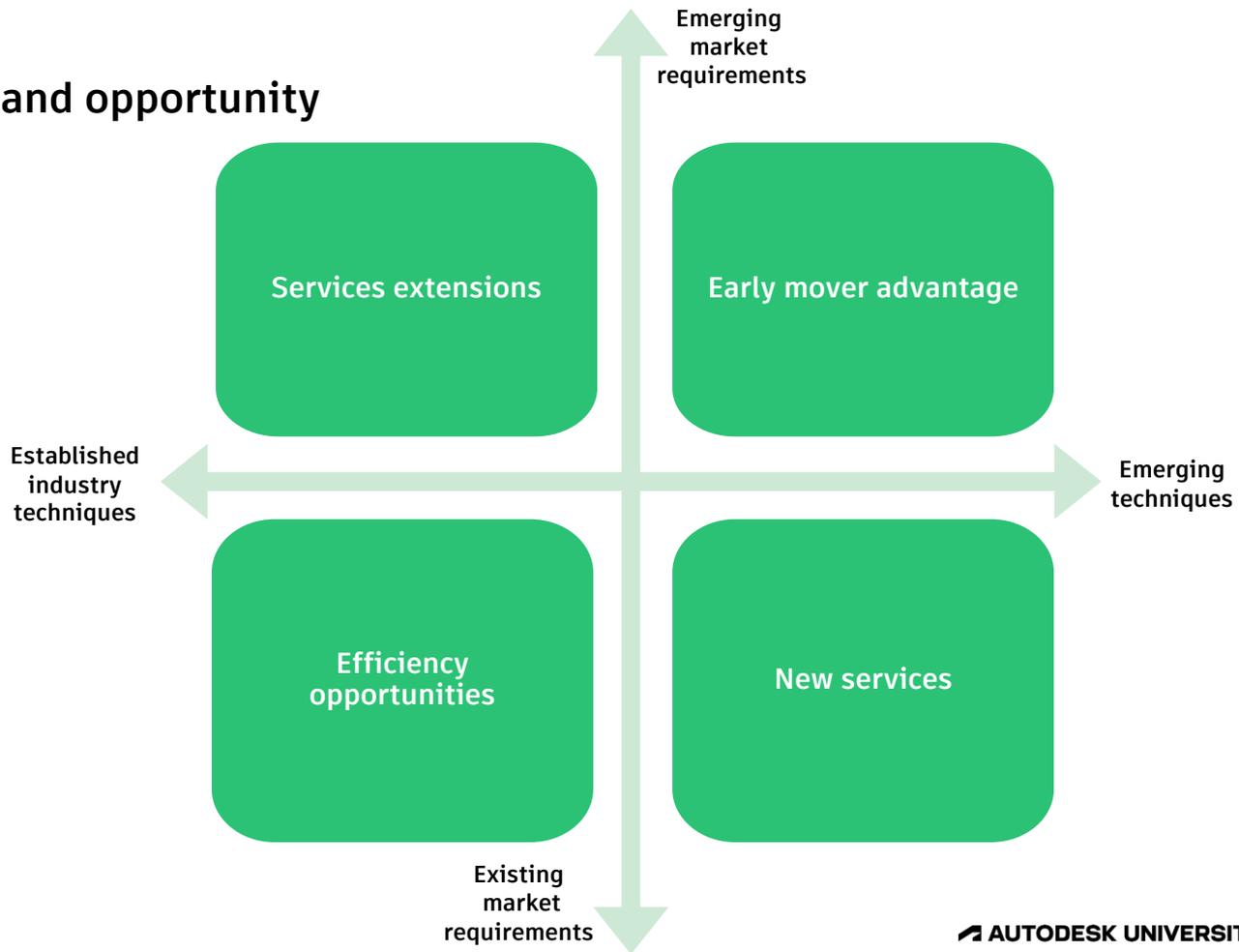
Mindset

Integrated management and opportunity



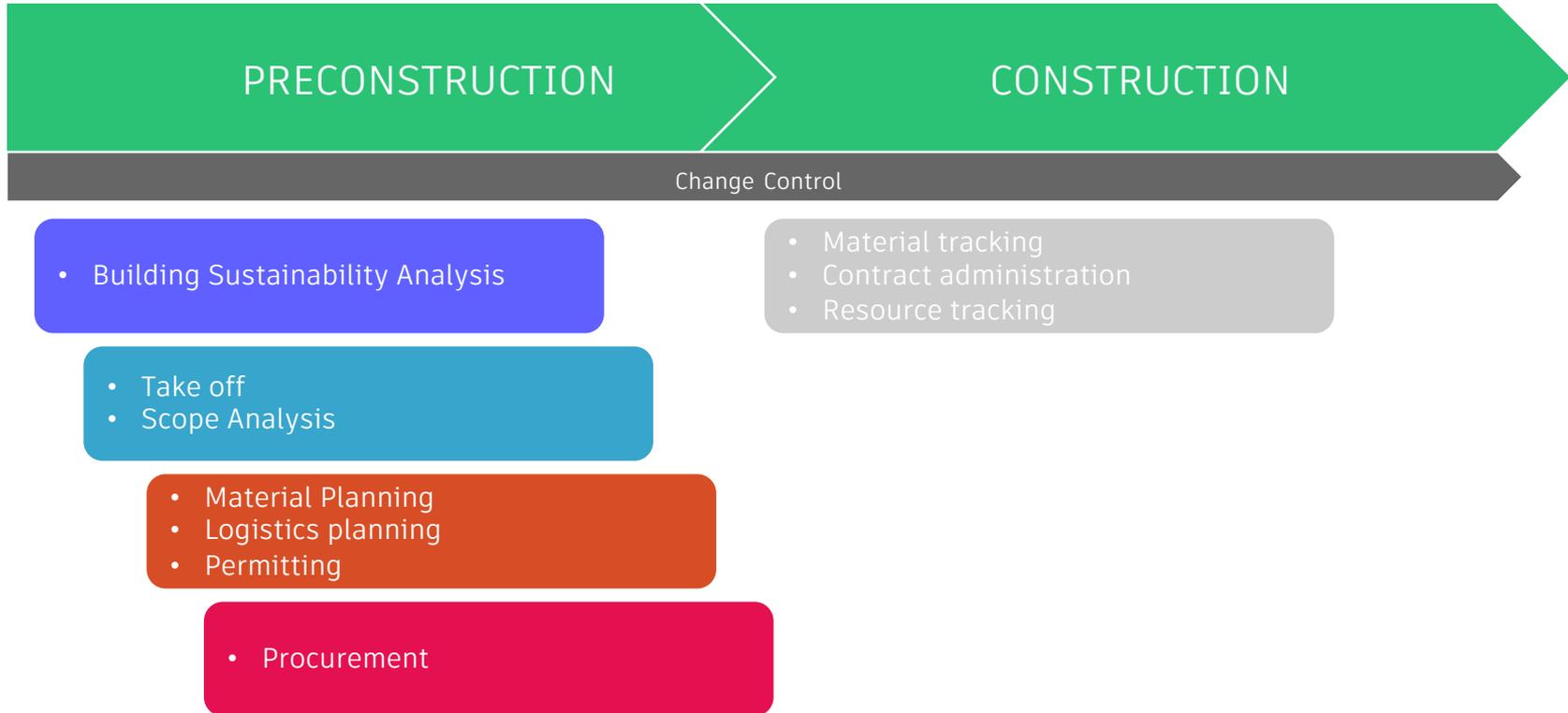
Mindset

Integrated management and opportunity



Skillsets

Effective carbon management integrates requirements into existing workflows



Toolsets

The screenshot shows the Autodesk Build interface for a 'Waste Audit Statement' form. The form is titled 'Waste Audit Statement Template' and includes a table for 'Construction and Demolition Phase' with six rows of questions. The interface also shows a sidebar with navigation options like Home, Sheets, Files, Issues, Forms, Photos, RFIs, Submittals, Meetings, Schedule, Work Plan, Assets, Reports, Members, Bridge, and Settings.

The screenshot shows the 'Settings' page in Autodesk Build, specifically the 'Types' section. It lists various issue categories and their status. The 'Construction Waste' category is highlighted, showing it is 'Active' and has a custom field 'Construction Waste Type'.

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

The screenshot shows a questionnaire titled '2. Air Quality' with three questions. Each question has radio button options for 'Yes', 'No', and 'NA', and a 'Photos' button. The questions are:

- Minimize dust from materials by using covers, storage, control equipment and increasing moisture content.
- Minimize dust from vehicle movements, using water sprays if appropriate.
- Avoid burning of materials on site.

 Below this is a section titled '3. Water - Run-off Management' with two questions:

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

Track air quality onsite with Build questionnaires

The 3D rendering shows a building with a complex, multi-level structure. The building is color-coded to show different materials and components. The text below the rendering indicates the percentage of waste minimization achieved:

- 94.73% container used
- 10% Foundations
- 61% First Level
- 24% Second Level
- 4% Roof

Generative design to minimize number of trips



**OPERATE &
MAINTAIN**

Why does it matter?

AEC represents ~40% of global GHG emissions.

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

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Why does it matter?

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

AEC represents ~40% of global GHG emissions.

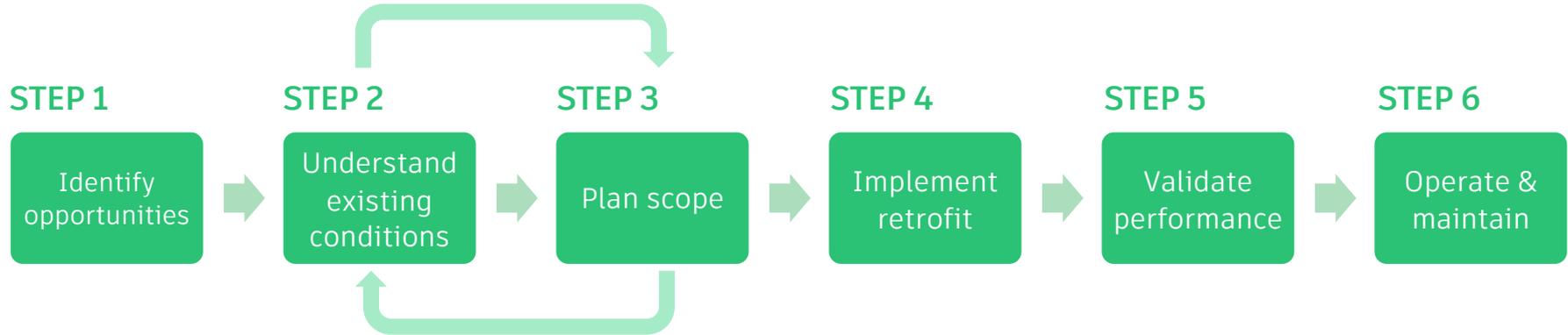
Global building energy use needs to reduce by 30% by 2030 to meet Paris Agreement targets.

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!

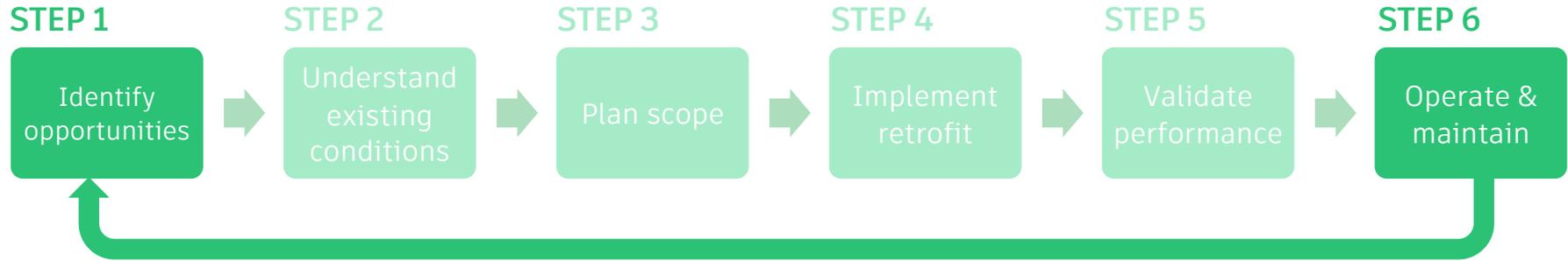
Simplified Retrofit Process Overview



Evaluate energy and cost trade-offs

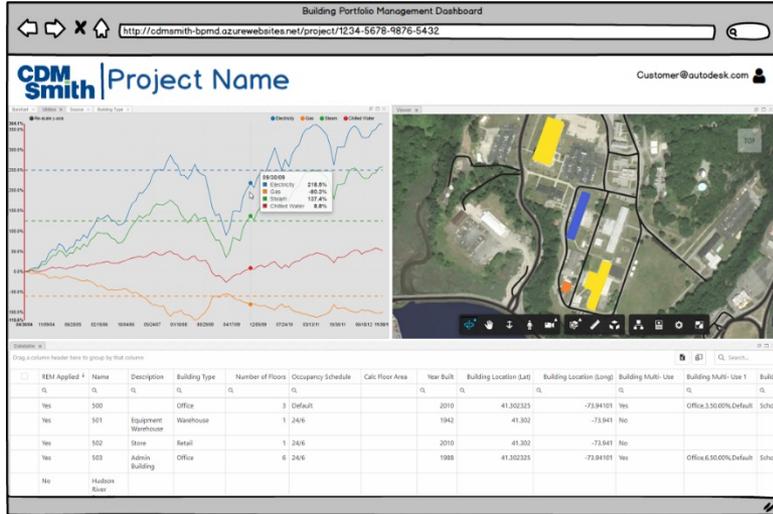


Digital Twins can create a link between O&M and opportunities for continued performance

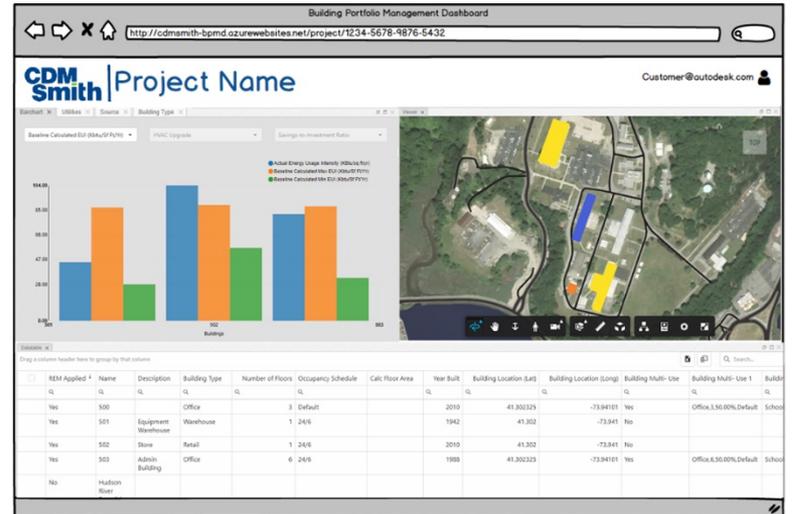


Portfolio Management Solutions

Rapid Energy Modeling tool



Actual utility usage



Actual EUI vs calculated min/max EUI

Tandem for Owners & Operators

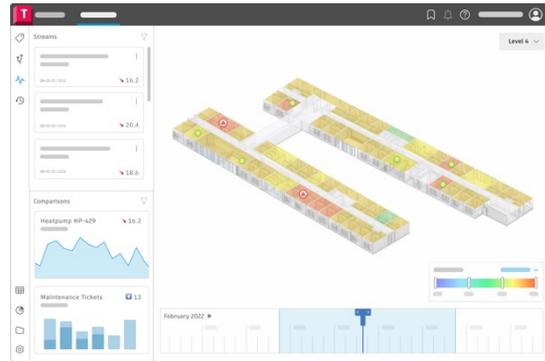
Now

Twin Building Descriptive Twin



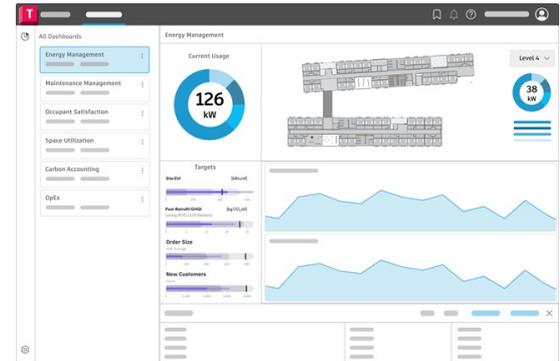
Next

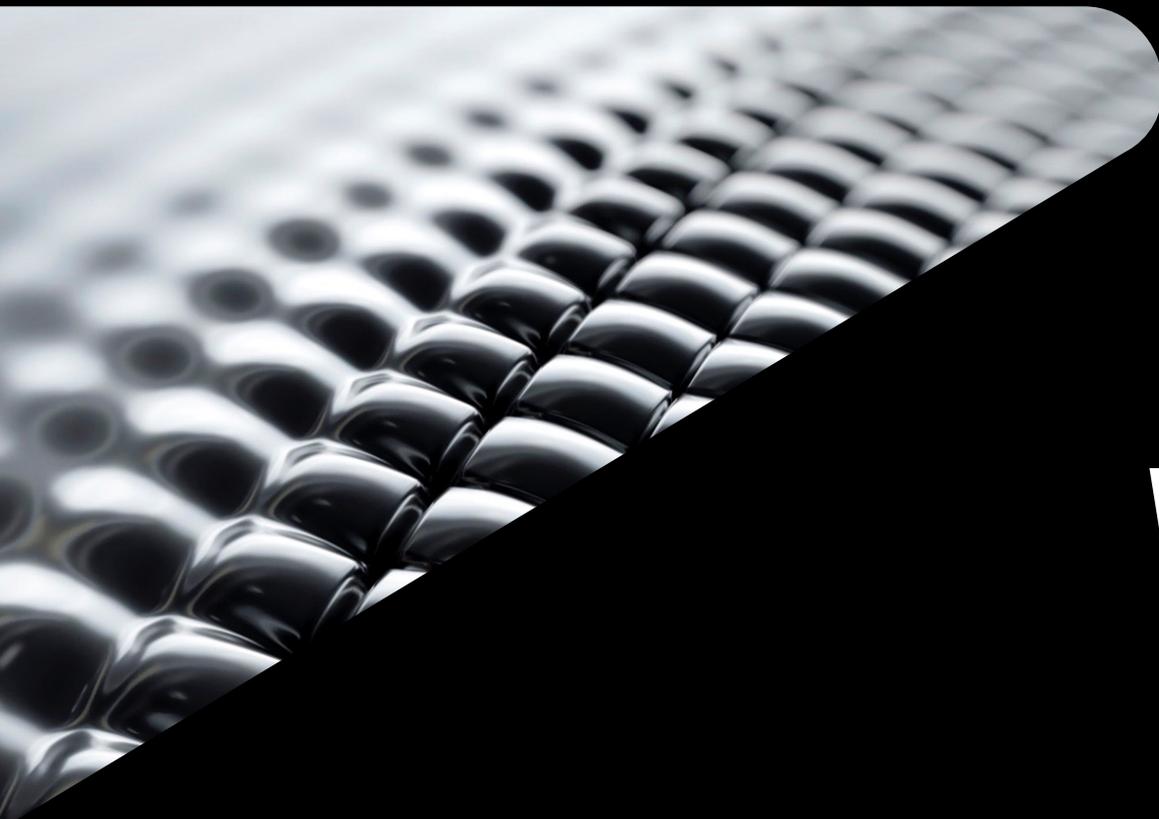
Facility Monitoring Informative Twin



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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