

BUILDINGENERGY NYC

AI Is Changing Sustainability in Construction

Brendan Hermalyn, Thalo Labs

Jack Rusk, C.Scale

Charley Stevenson, Materially Better

Curated by Aaryan Manoj Nair & Jane Bartman

Northeast Sustainable Energy Association (NESEA) | October 15, 2026

FRAMING QUESTION

Given the concerns around AI and sustainability, what is the upside you see?

Our speakers:



Brendan Hermalyn

Founder and CEO
Thalo Labs

OPERATIONS & MAINTENANCE



Jack Rusk

Co-founder and CEO
C.Scale

DESIGN PROCESS

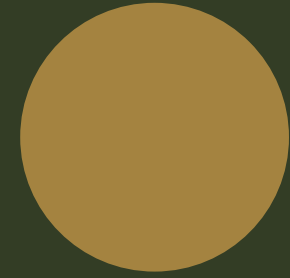


Charley Stevenson

Founder
Materially Better

PORTFOLIO DATA

Materially Better





36

PROJECTS

1,500

DOCUMENTS

35,000

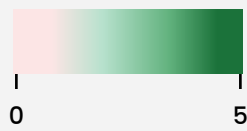
PRODUCTS

2,400

UNIQUE
PRODUCTS

Opportunity to Improve

LEED Score



Opportunity Gap

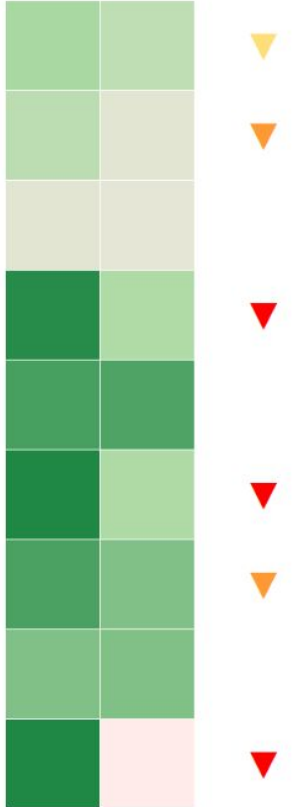
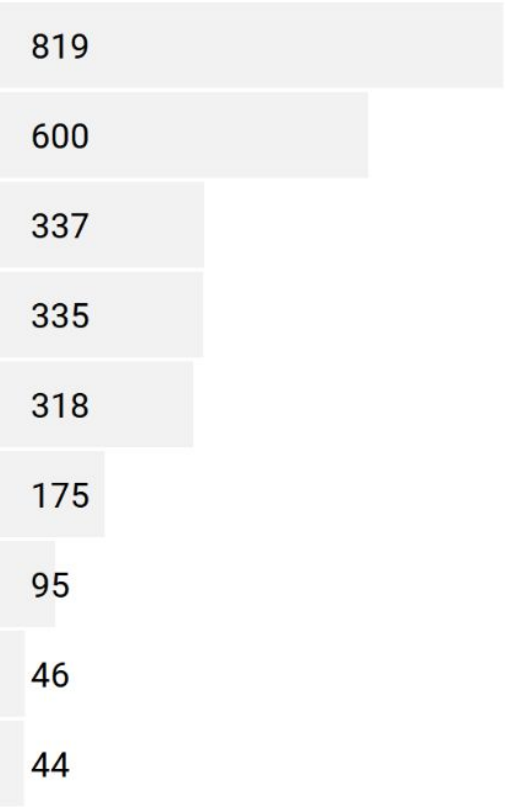


Product Category

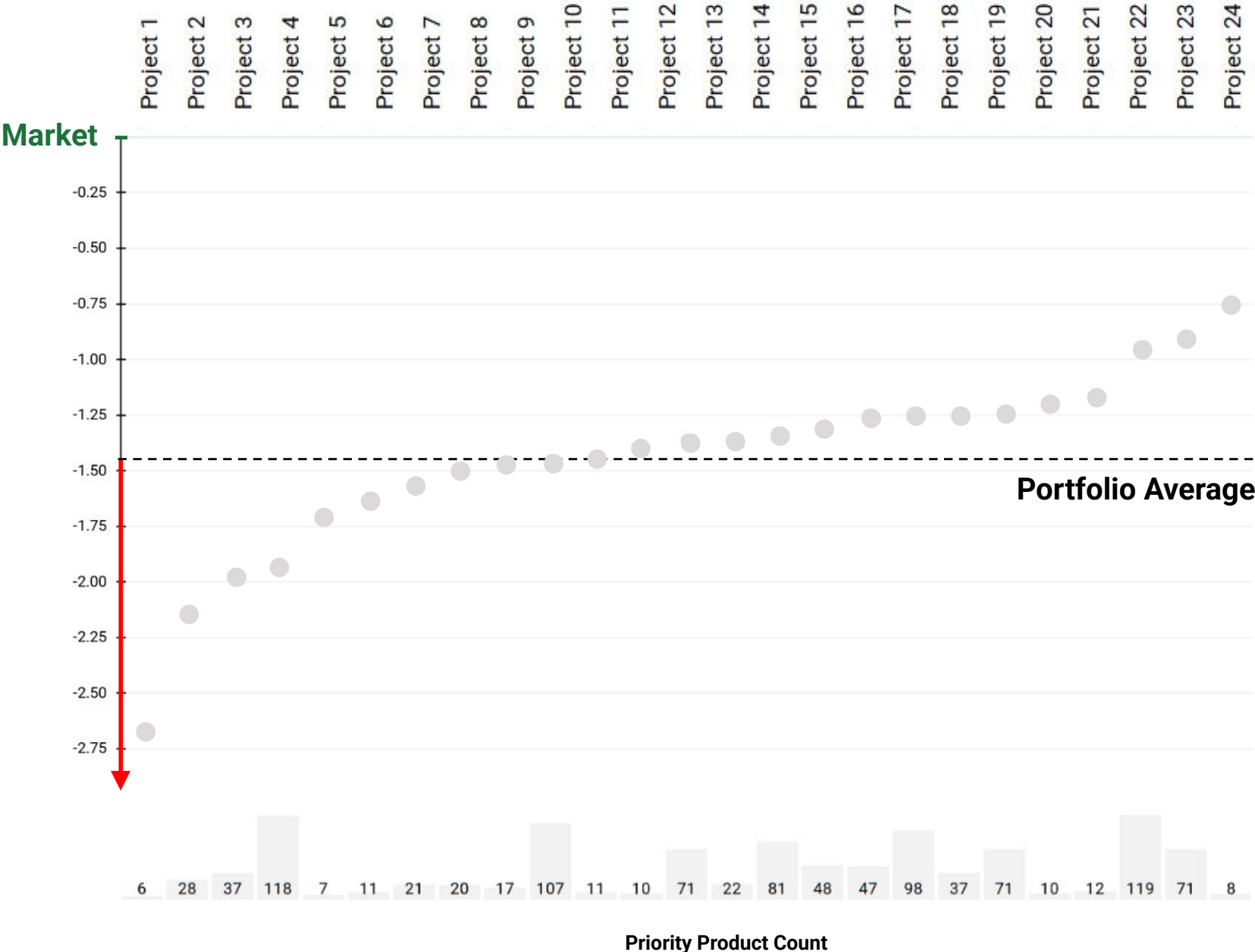
Submittal Products

Market Portfolio

Gypsum Wall Assemblies
Paints and coatings
Adhesives and Sealants
Flooring
Ceilings
Tiling + Base
Insulation
Wall Coverings + Doors
Composite Wood

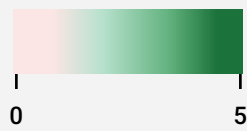


Opportunity by Project



Most Used Manufacturers

LEED Score



Opportunity Gap



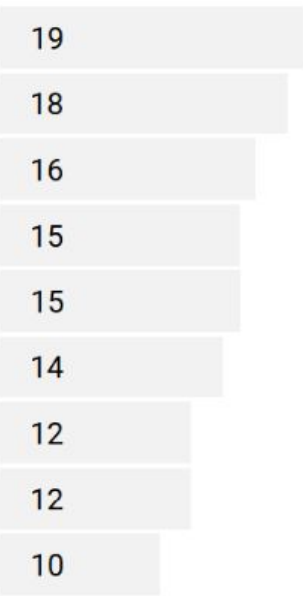
Projects

ClarkDietrich
Armstrong World Industries
Hilti
Sherwin-Williams
Mapei
Tarkett
CertainTeed
Owens Corning
United States Gypsum (USG)

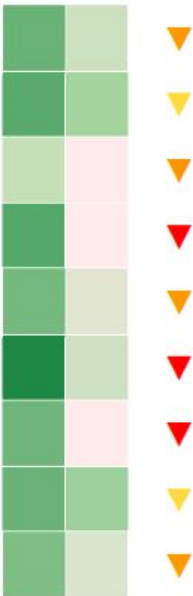
Product Category

Wall Assemblies
Ceilings
Adhesives and Sealants
Paints and coatings
Adhesives and Sealants
Flooring
Walls
Insulation
Walls

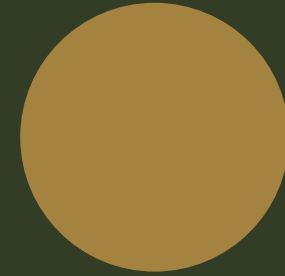
Projects



Market Manufacturer



Thalo Labs



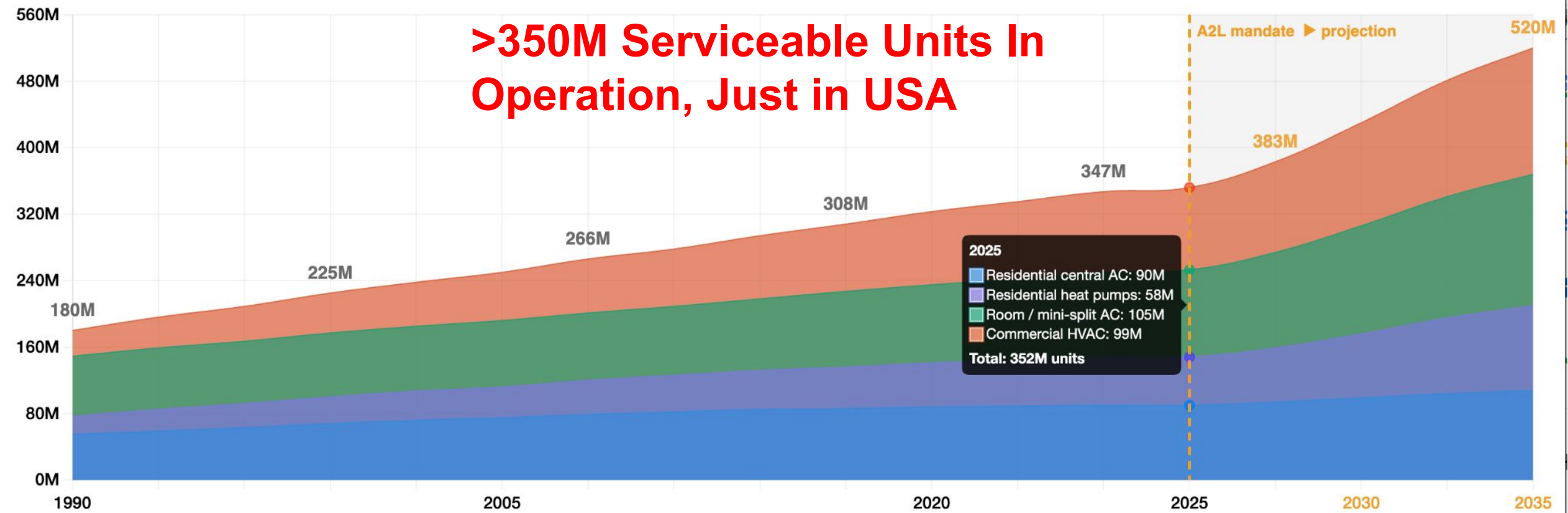


How we think it's going



How it's actually going

Residential central AC Residential heat pumps Room / mini-split AC Commercial HVAC



Sources: AHRI historical shipments, EIA RECS 2009/2020, IEA Future of Cooling (2018). Active stock modeled using annual shipments + ~15-yr average equipment lifespan. Post-2025 projections aligned with high-case shipment growth (~15M units/yr by 2030). Gray zone = projection. A2L mandate = Jan 1, 2025.

The Problem

U.S. Commercial HVAC contractors still rely on emergency calls and calendar driven maintenance.

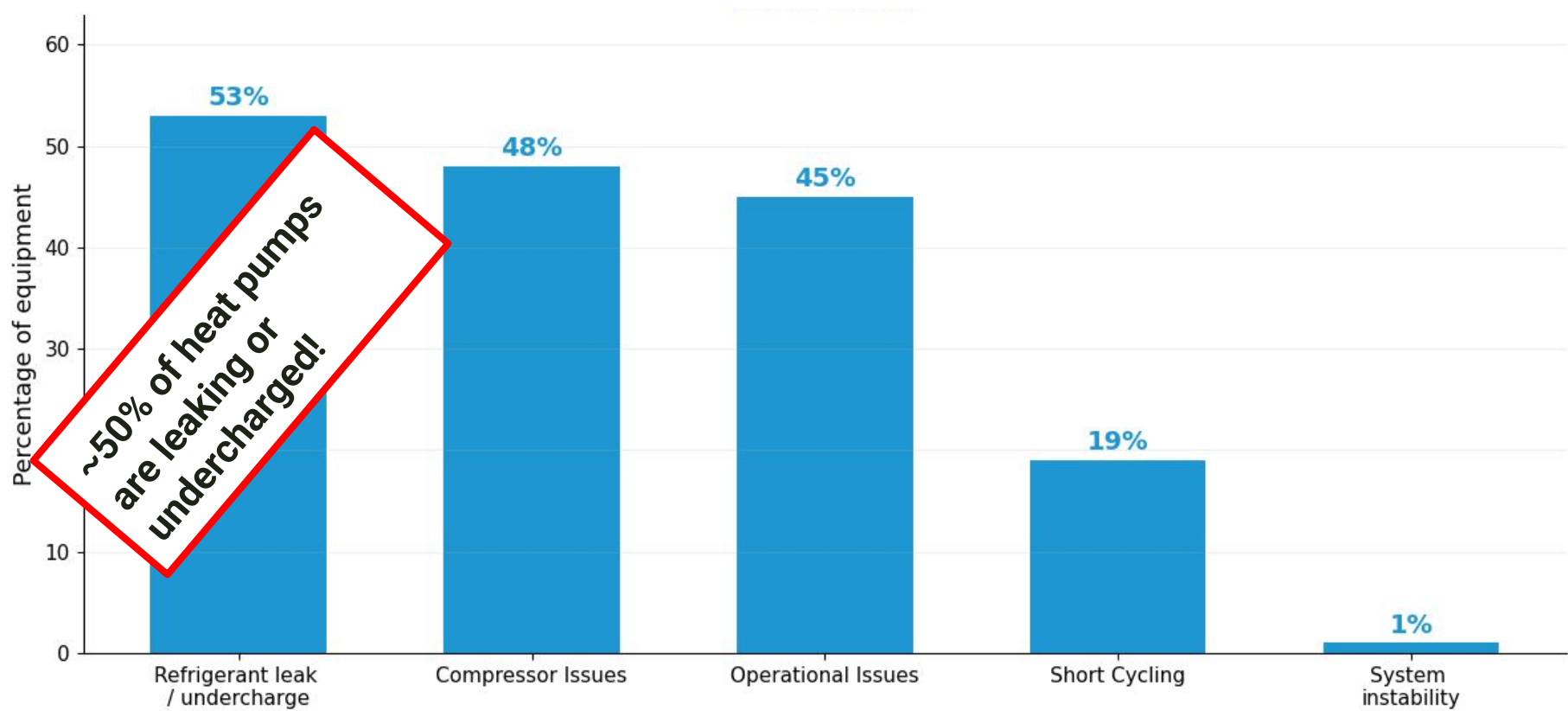
- ▶ 1 in 4 installations or fixes fails the first time (23% return rate)
- ▶ Contractors know and accept this (first time fix rate has sat at 70-80% for decades)
- ▶ They're running a \$156B industry on 8% net margins with no visibility into why jobs fail, and with only 400k techs



This is John, testing for a gas leak on a boiler at a Fortune 50 Bank...with a lighter.

SOURCES: U.S. Bureau of Labor Statistics (BLS), historical occupational employment data; AHRI

Refrigerant Equipment Issue Occurrence and Impact



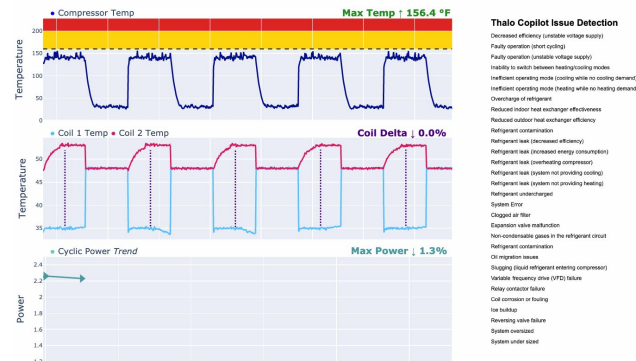
Thalo has built the fleet management platform for HVAC.

Better data enables better service.



Our hardware enables you to put a tiny robot HVAC technician on every asset, quickly and easily. Agnostic of brand, age, or building management.

Give every heat pump a cell phone.



Thalo's real-time connectivity and ML models of HVAC equipment allow us to analyze the physics of refrigerant loops. Inspired by work at Waymo, NASA, and Cruise.

AI turns dots into diagnostics.



Prognostic intelligence is key to value. We can diagnose issues weeks or months before they show up in performance, and get better with every model.

AI Food...column

Product

- Chatbots
- Cool big data stuff
- Frickin' robots

Eng Enablement

- Mr. Claude Code
- Firmware
- HW/SW interfaces

Sales Enablement

- Outbound Spam
- Bookings
- Materials

Biz Ops + Interconnect

- Accounting
- Billing
- Dispatching
- CEO dashboard

AI Food...column



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Sales
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Biz Ops +
Interconnect

- Accounting
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How we think it's going



+

```
thalo — * Debug lost mail integration — claude --dangerously-skip-permissions — 120x30

Read 1 file, recalled 1 memory, wrote 2 memories (ctrl+o to expand)

• Done. Summary of the whole session:

Diagnosed the mail outage — a dead Gmail refresh token (invalid_grant), confirmed by your screenshot ("Token refresh failed"). The code hadn't changed in 4.5 months, so it was purely a credential-layer failure.

Shipped to master (both pushed):
1. 42b3d67 — fixed the Sheets health check (was reading a nonexistent KV key), the Claude false-green on HTTP 400, the boto UTF-8 send crash, the vague Gmail error, the cron that silently did nothing without the UI, and added a build-version display.
2. f989947 — the self-serve multi-user Gmail connect flow, so Elaine and the rest of the team each connect their own mailbox with one click.

Your remaining actions: register the redirect URI, publish the OAuth consent screen (fixes the root cause), and deploy — the three steps above. After that, mail comes back and stays connected.

I also saved the CRM project context to memory for next time.

* Cooked for 11m 19s

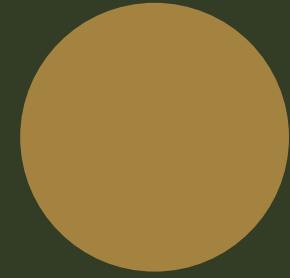
* recap: Goal: fix Thalo CRM's broken Gmail integration and add self-serve email connect. Both are done and pushed to master. Next: you deploy (build frontend, then 'npm run deploy' in workers) and register the OAuth redirect URI so mail reconnects. (disable recaps in /config)

> |

>> Bypass permissions on (shift+tab to cycle) - < for agents
```

How it's actually going

C.Scale



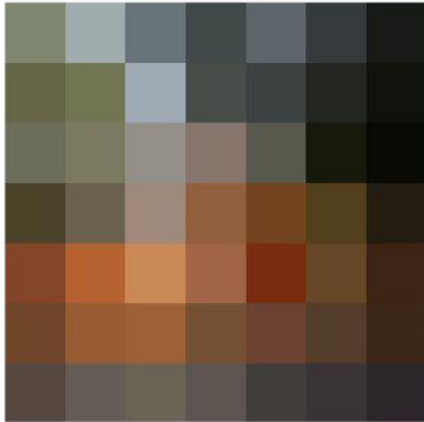
Design-Integrated Decarbonization

c.scaleTM



SUPPORTING THE DESIGN PROCESS

Supporting your workflow from concept through construction



Pre-Design and Programming

Insight into the big decisions. Understand baselines and explore possibilities.



Schematic Design

Compare assemblies at a generic level and establish basis-of- design for key systems.



Design Development

Connect to BIM to fine-tune quantities. Address carbon hotspots and identify basis-of design products for all key categories.



Construction Documents

Complete whole building life cycle assessment and coordinate product criteria with specifications.



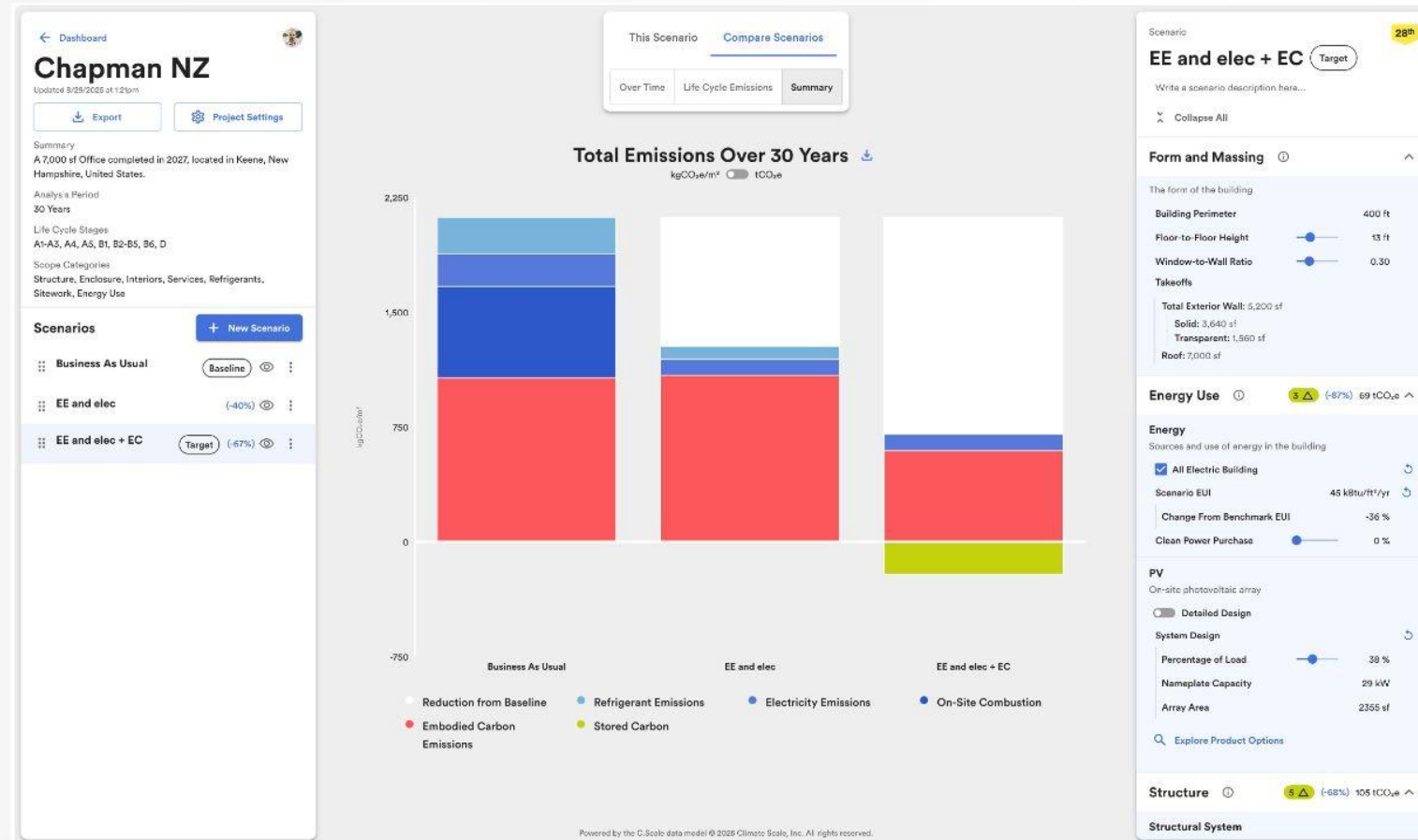
Approvals and Procurement

Export LEED and AHJ documentation. Rapidly study VE and substitution requests within your BIM model.

EARLY PHASE DECISIONS

Set **whole building** design and material strategy

Consider the most impactful options like choice of structural system, to build new or retrofit, or differences in massing



ASSEMBLY CONFIGURATION

Configure major assemblies to determine where to focus

Swap assemblies element by element and see each one's share of the building's embodied emissions.

← Dashboard

Chapman NZ

Updated 8/29/2025 at 1:13pm

Export

Project Settings

Summary

A 7,000 sf Office completed in 2027, located in Keene, New Hampshire, United States.

Analysis Period

30 Years

Life Cycle Stages

A1-A3, A4, A5, B1, B2-B5, B6, D

Scope Categories

Structure, Enclosure, Interiors, Services, Refrigerants, Sitework, Energy Use

Scenarios

+ New Scenario

Business As Usual

Baseline

EE and elec

(-40%)

EE and elec + EC

Target (-67%)

Enclosure

Life Cycle Emissions

Area vs. Emissions

Emissions by Assembly

TCO_e Area Subcategory Assembly

Curtain Wall

Built-Up Roofing

Thin Brick Rainscreen

Name	Area (%)	Total Emissions
▼ Solid Exterior Wall	100% of 3,640 sf	53,186 kgCO ₂ e
Thin Brick Rainscreen	100 % 3,640 sf	53,186 kgCO ₂ e
+ New Entry		
▼ Transparent Exterior Wall	100% of 1,560 sf	17,417 kgCO ₂ e
Curtain Wall	100 % 1,560 sf	17,417 kgCO ₂ e
+ New Entry		
▼ Roof Assemblies	100% of 7,000 sf	19,260 kgCO ₂ e
Built-Up Roofing	100 % 7,000 sf	19,260 kgCO ₂ e
+ New Entry		

Curtain Wall

Quantities

Area (%)

Area: 1,560 sf

Assembly Data

Glazing Type

Curtain Wall

Glazing Unit

Double-Glazed IGU

Frame

Aluminum

Material Origin

New Construction

Carbon Intensity

Low Carbon

A1-A3: 8.01 kgCO₂e/sf

Service Life

30

Procurement

Explore Product Options

Description

Utilized curtainwall framing system using extruded aluminum profiles, designed to transfer wind loads to the main building structure. This frame holds a double-glazed insulated glazing unit consisting of two panes of glass separated by a sealed spacer and inert gas-filled cavity. Interior finishes are excluded from this assembly as they appear within the interiors calculation.

Cancel

Update

DETAILED MATERIAL SPECIFICATION

Select specific materials and conduct detailed assessment

Browse manufacturer products by category and compare their carbon intensity as you specify.

Interiors



Products

Hotspots

Click any segment to view

MATERIAL	IMPACT SOURCE	EMISSIONS	SHARE
Ceilings			
CertainTeed Versatone A...	● Product EPD	9.2 tCO ₂ e	15%
Suspension grid	● Industry EPD	4.2 tCO ₂ e	7%
Interior Walls			
Gypsum board	● Product EPD	12.7 tCO ₂ e	21%
Paint	● Industry EPD	5.0 tCO ₂ e	8%
Flooring			
Carpet tile	● Product EPD	8.5 tCO ₂ e	14%
Resilient flooring	● Product EPD	6.4 tCO ₂ e	10%

CertainTeed Versatone A...

Ceilings > Acoustic Ceiling Tile (ACT),
Fiberglass > ACT, fiberglass

Material Data

Material ACT, fiberglass ▾

CertainTeed Saint-Gobain
CertainTeed Versatone A... ×

A1-A3 GWP 2.9 kgCO₂e/m²

Quantity per Area 1.00 ft² / ft²

Service Life

Material Origin New ▾

[See all products](#) →

TALLY + C.SCALE

AI-assisted bill of materials parsing

Upload your Excel file, map your columns, and review AI material mapping.

COMMON SOURCES

Interiors teams

Import quantities without a Revit model

Contractor cost estimates

Quantities from the contractor, used to represent the As-Built



.xlsx

Bill of Materials

C.Scale

Import Bill of Materials

- ✓ Select File
- ✓ Map Columns
- 3 **Map Materials**
- 4 Confirm

Gypsum board	Exact Match
Carpet tile	AI Mapping
Acoustic ceiling tile	Previous Mapping
Ready-mix concrete	Exact Match

BIM-BASED LCA

Tally performs LCA from BIM

Tally runs whole life carbon analysis inside Revit, with AI mapping each model element to a material.

LCA plug-in for Revit

Design-integrated LCA: whole life carbon results natively inside your core design and documentation model.

AI-assisted element mapping

AI maps each Revit element to one or many materials and their quantities, then you copy those definition across every Revit family. Future mappings learn from previous behavior.

Design-integrated reporting

Dig deeply into your design decisions — evaluate whole buildings, design options, and identify hot spots. Coordinate analysis and reporting across the team.



TAKEOFF METHOD

by Area and reference area density

by Area and default area density

by Area and reference area density

by Area and custom area density

1 coat plus primer (0.04 lb/ft²)

2 coats plus primer (0.06 lb/ft²)

3 coats plus primer (0.08 lb/ft²)

Display results grouped by...

Division

Life Cycle Stage

Material

Revit Category

Family

Building Element

Sub-Element

Gypsum wallboard type

Gypsum wallboard, lightweight, 1/2"

Gypsum wallboard, type X, 5/8"
Fire-resistant gypsum board

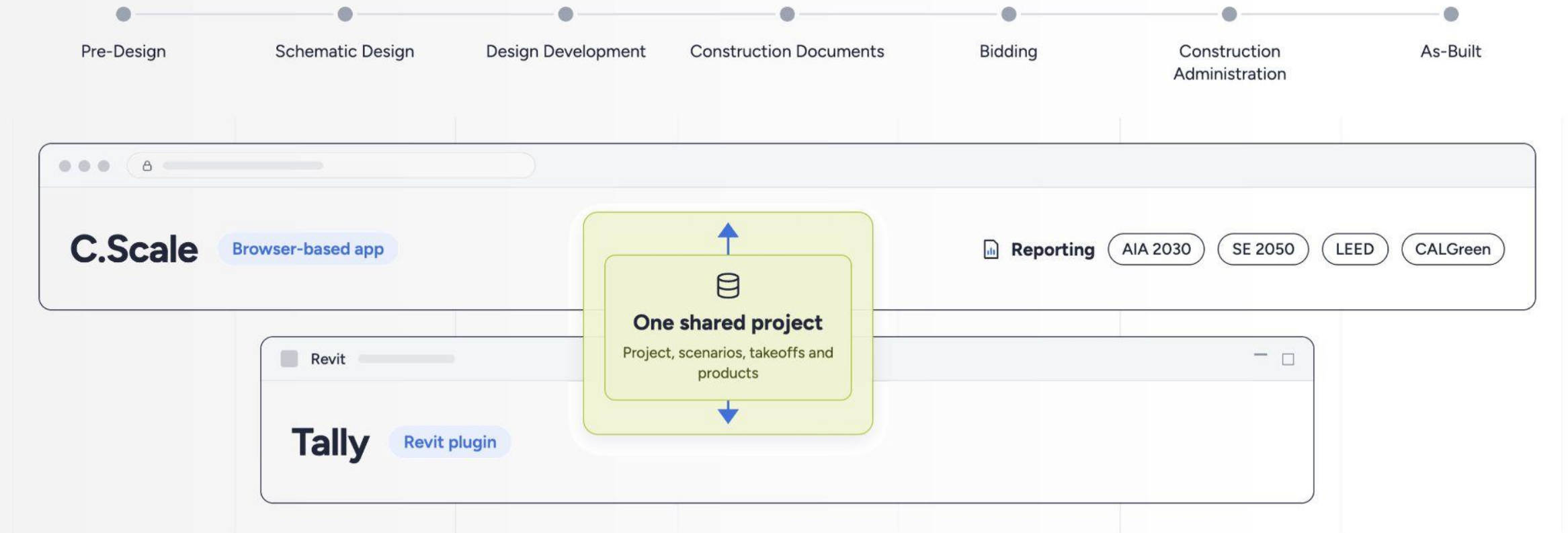
Gypsum wallboard, lightweight, 1/2"
Standard interior wallboard



TALLY + C.SCALE

Shared data context between Revit and the web

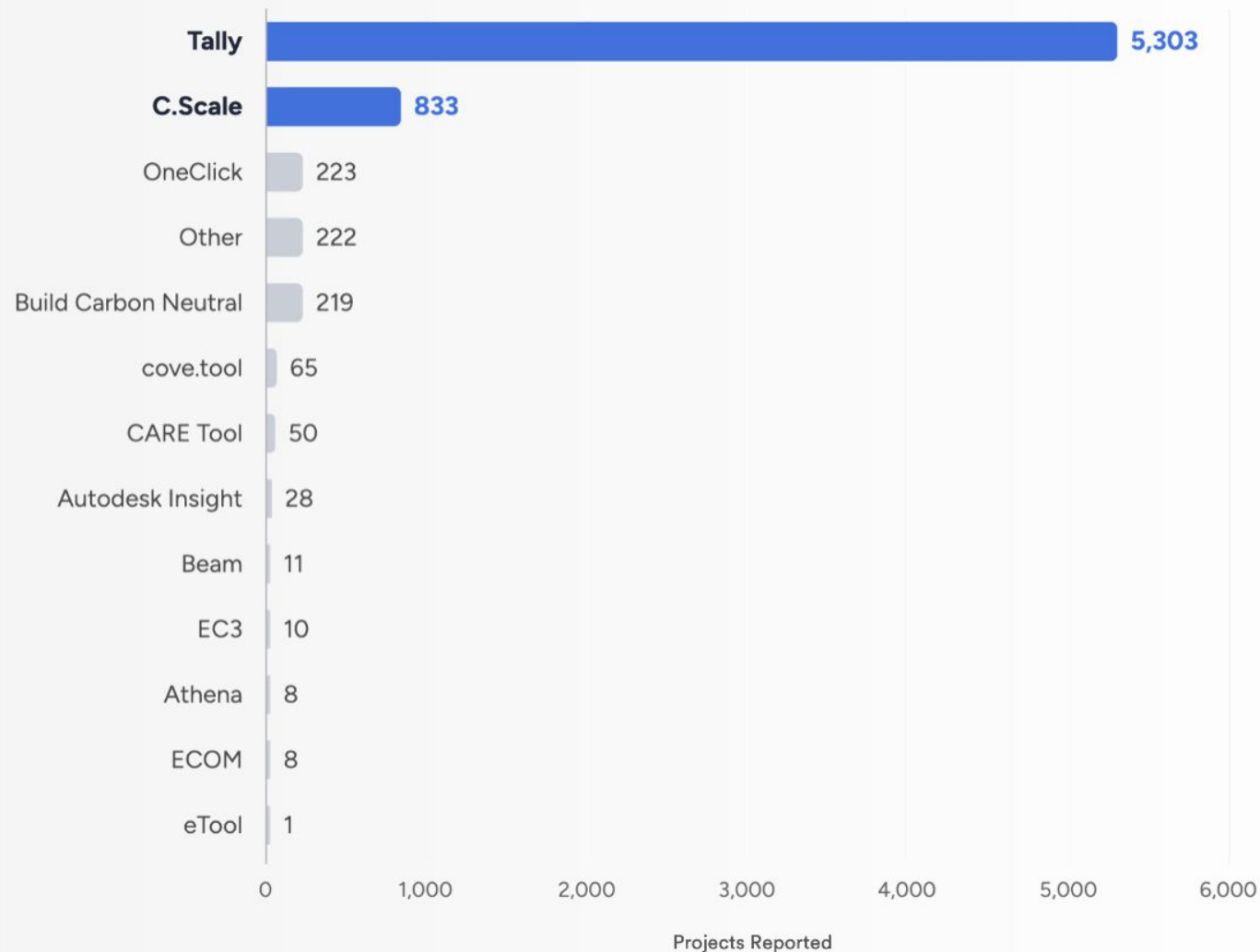
Tally in Revit and C.Scale on the web work from one shared project, from pre-design through as-built.



AIA 2030

Gearing up for 2026 reporting season

Report all of your projects using the model you already built.



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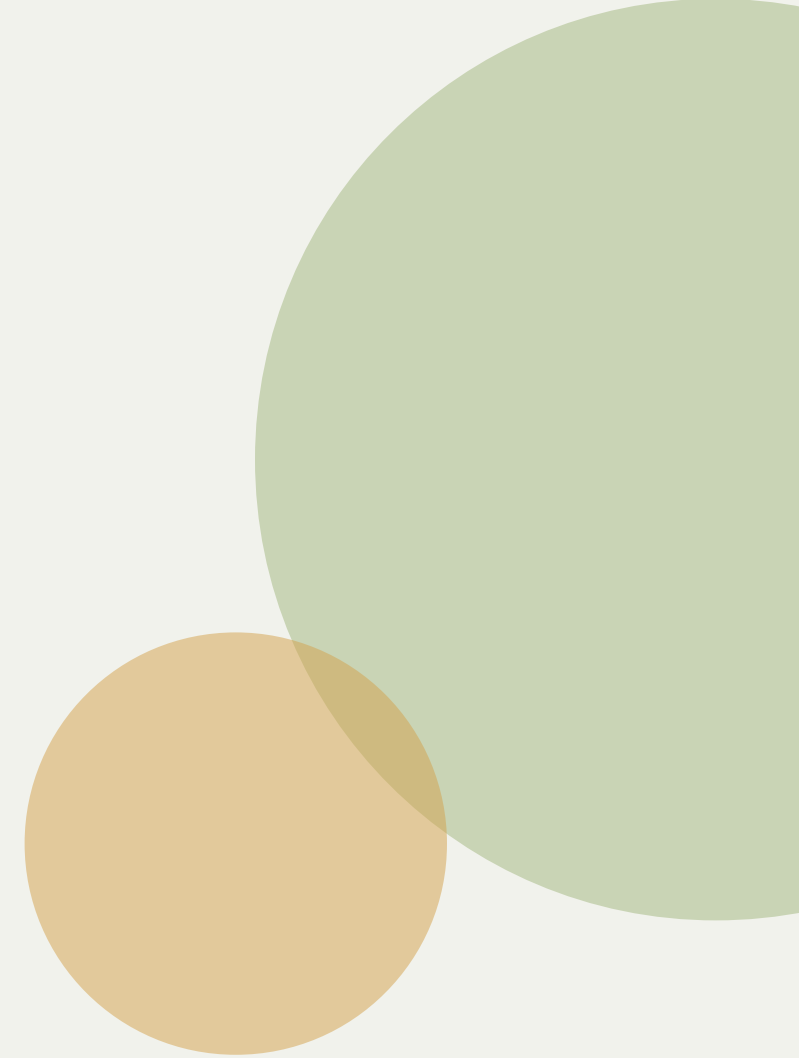
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The question is about whether the system is a "black box" or a "white box". The system is a "black box" if the user does not know the internal structure of the system. The system is a "white box" if the user knows the internal structure of the system. The system is a "black box" if the user does not know the internal structure of the system. The system is a "white box" if the user knows the internal structure of the system.

The system is a "black box" if the user does not know the internal structure of the system.

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Panel Discussion & Q&A



WHERE WE GO FROM HERE

What will you do differently **on Monday?**

BUILDINGENERGY NYC

Please fill out an evaluation for this session



or: nesea.org/eval

Northeast Sustainable Energy Association (NESEA)



1-2-4-All



Invitation

What opportunities do you see
for making progress on the
challenge at hand?

Steps, Timing

Individual: 1 min

Pair/trio: 2 min

Quartet/trio: 5 min

Plenary: 7 min

Group Configuration

Pairs, Foursomes, Whole Group;
1-3-All online



Space, Materials

Space for pairs and quartets;
breakout rooms online

Participation Distribution

Everyone is invited and has an equal
opportunity to contribute, host [tech
host]