

Net Zero Emerging Leader Internship

Scott Edwards Architecture | Energy Trust of Oregon
Melanie Guyer | 2023



Scott
Edwards
Architecture

Melanie Guyer

Masters of Architecture Track I

School of Architecture and Environment

University of Oregon

BA in Linguistics, Dartmouth College

Interested in:

- Sustainable architecture
- Social justice through design
- Data visualization
- Home renovation



By the numbers

01

year reporting

50

met 2030 target

72

whole building

62

interiors only

18

projects with PV

25

use types

18

states

88%

of active projects

13

energy codes

38

data loggers

18

energy models

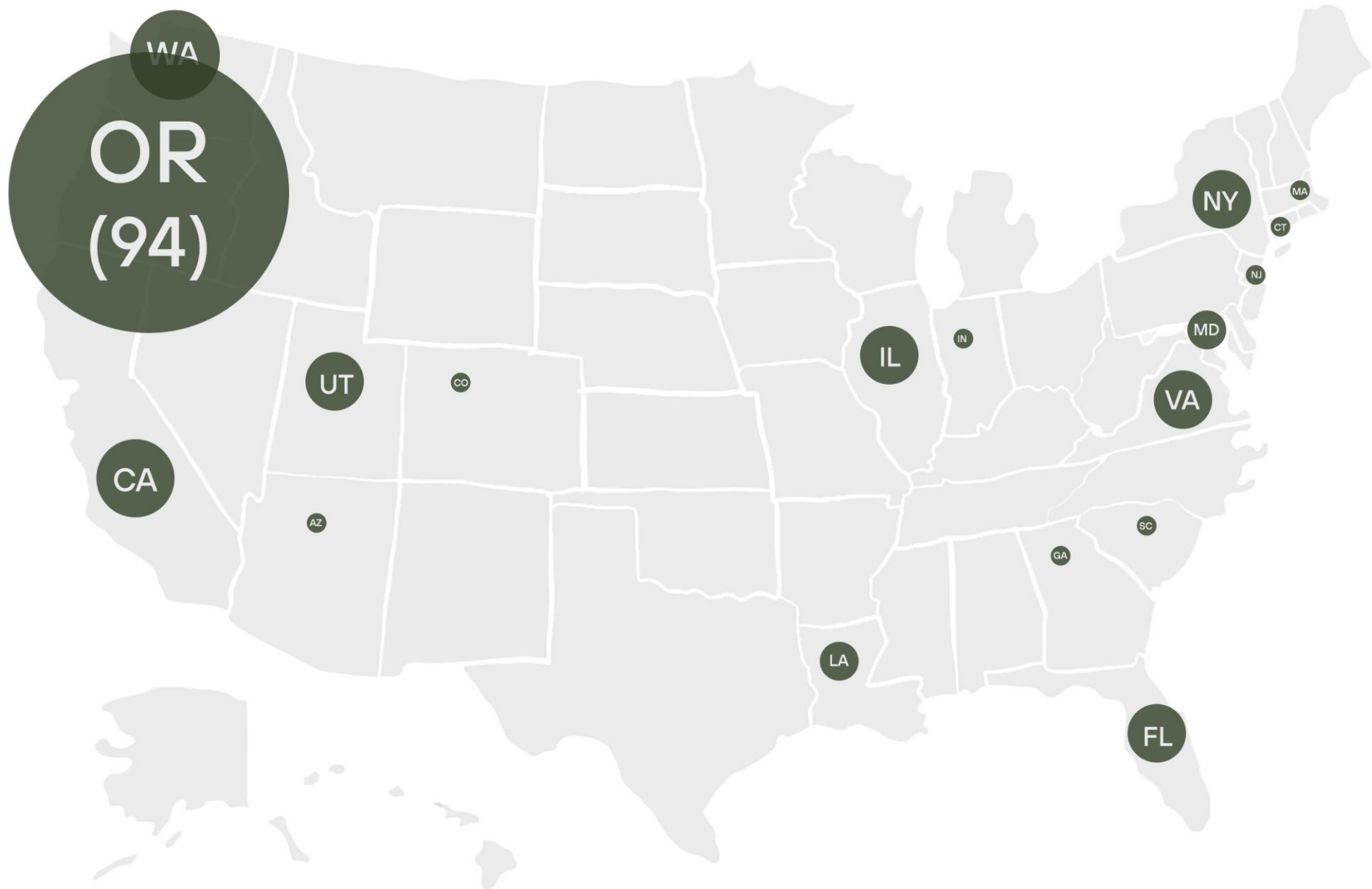
2,087,022

square feet logged

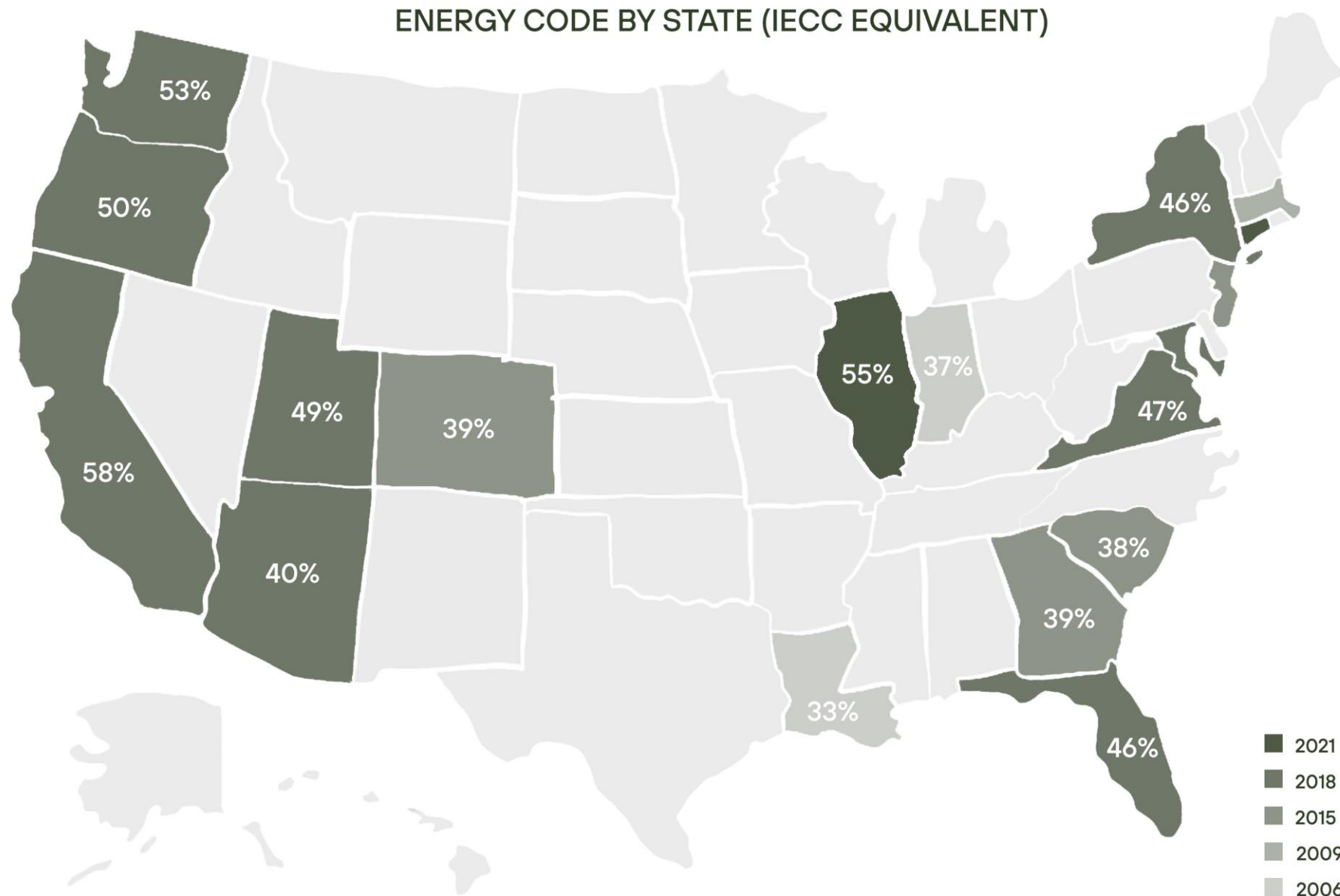
134

projects logged

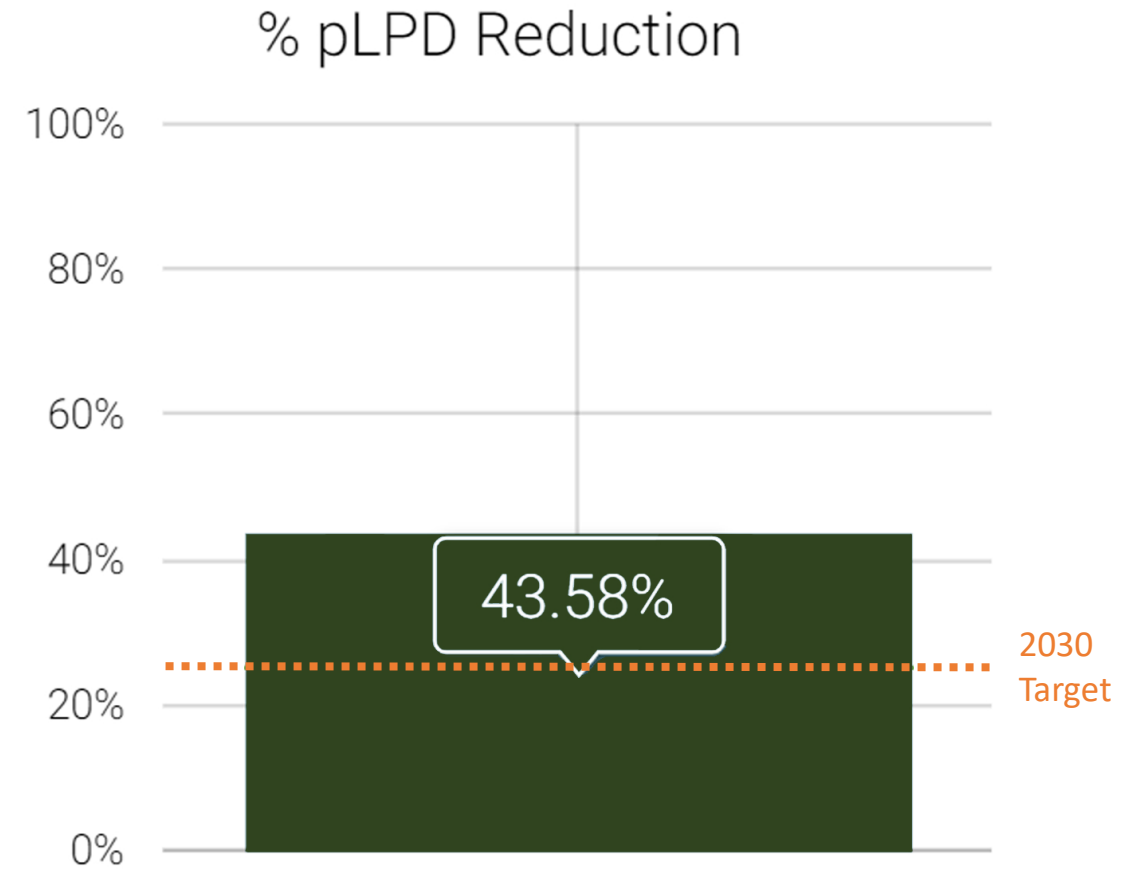
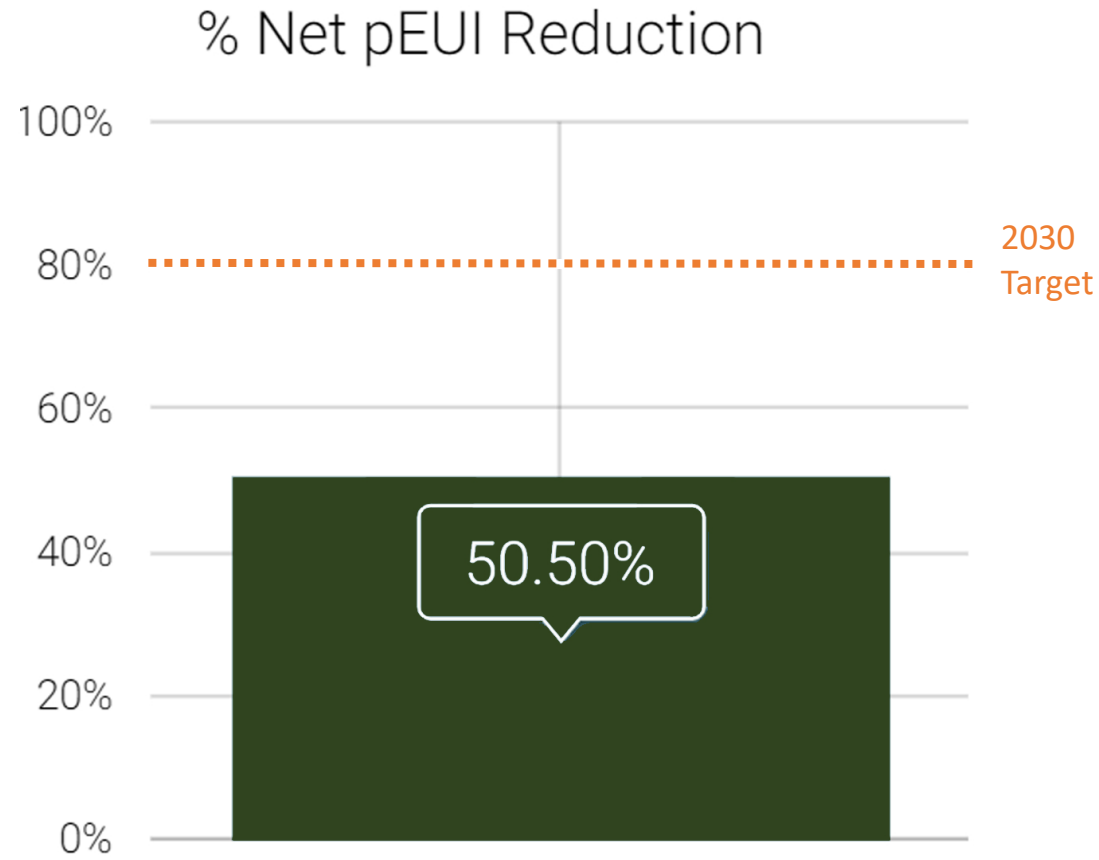
Project locations



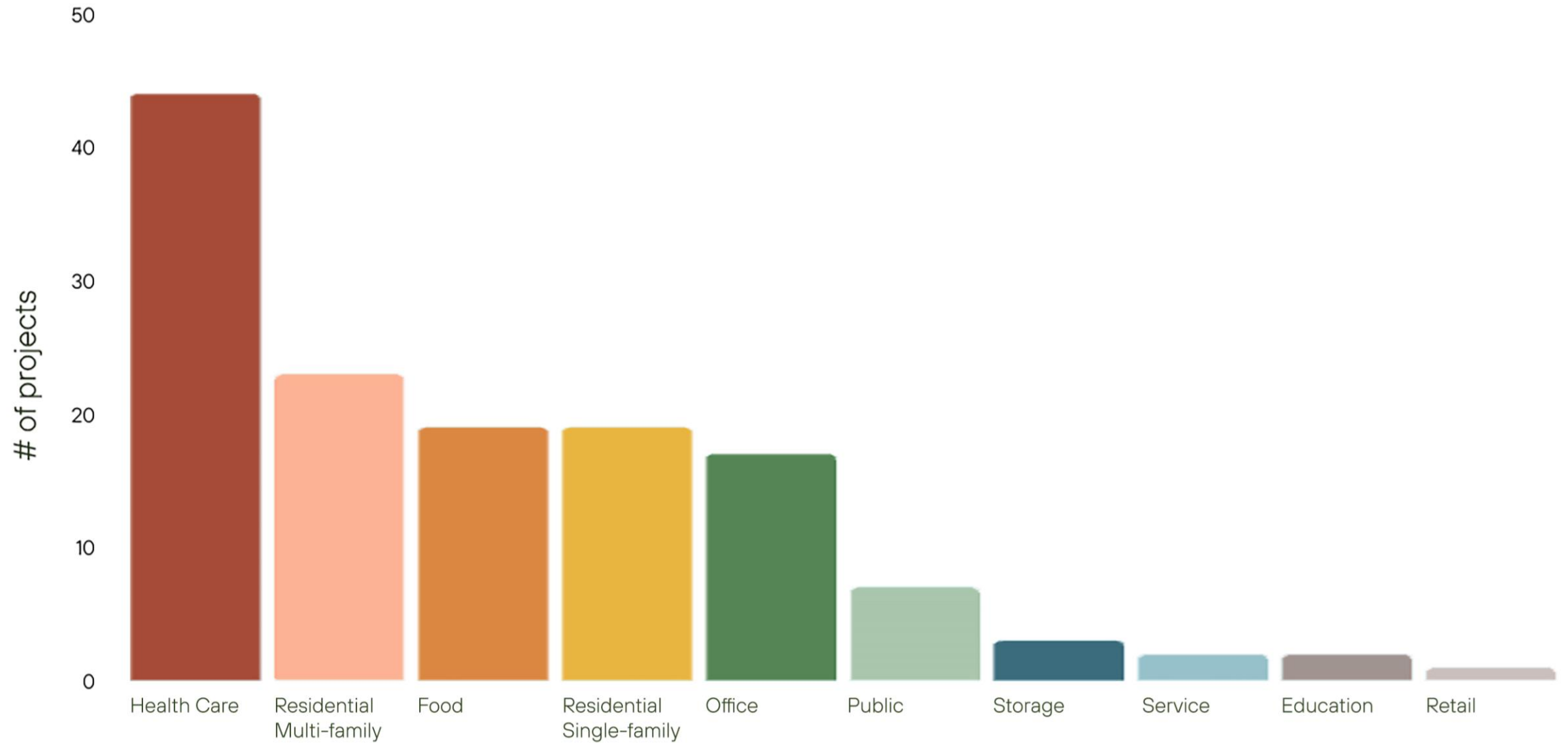
Energy codes



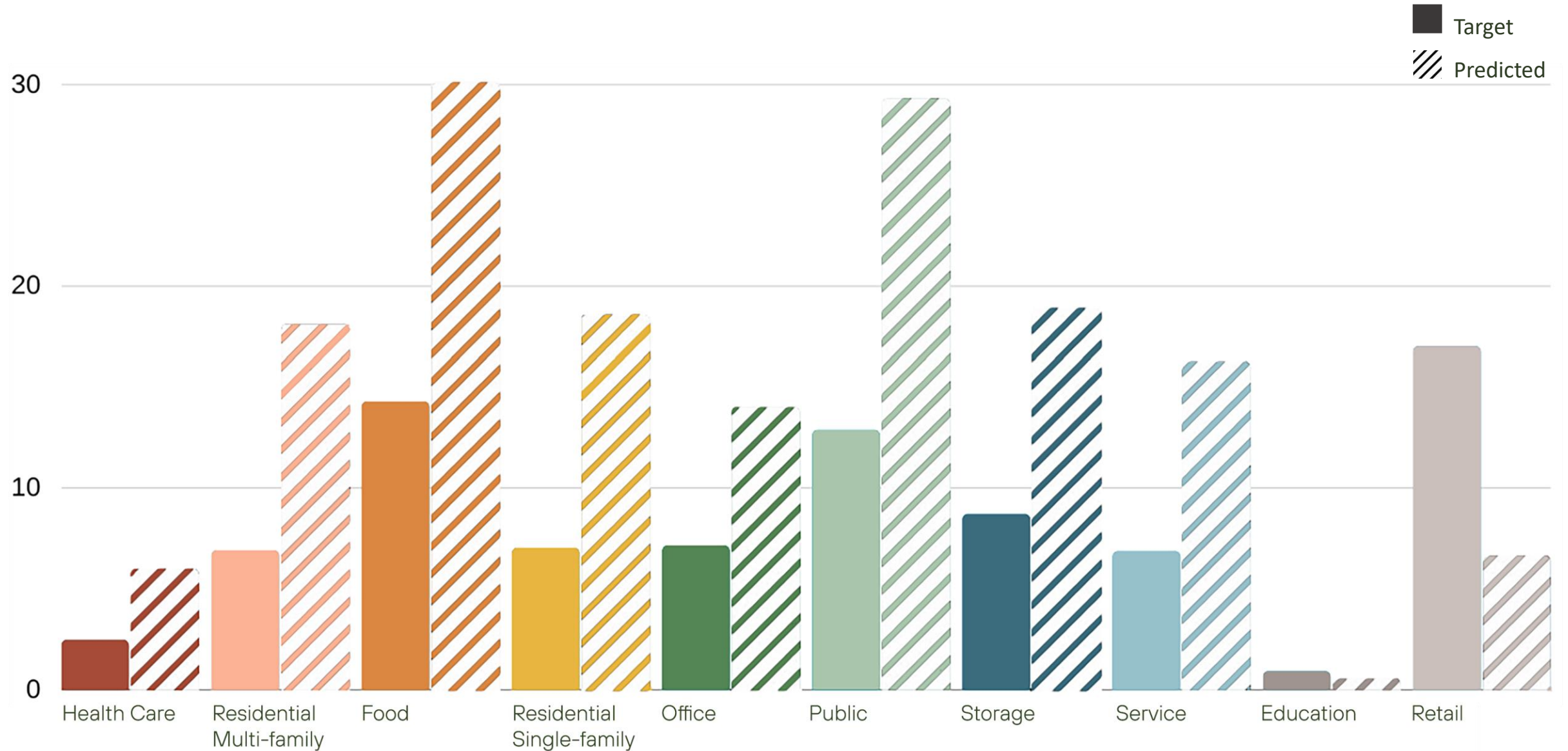
Energy reduction



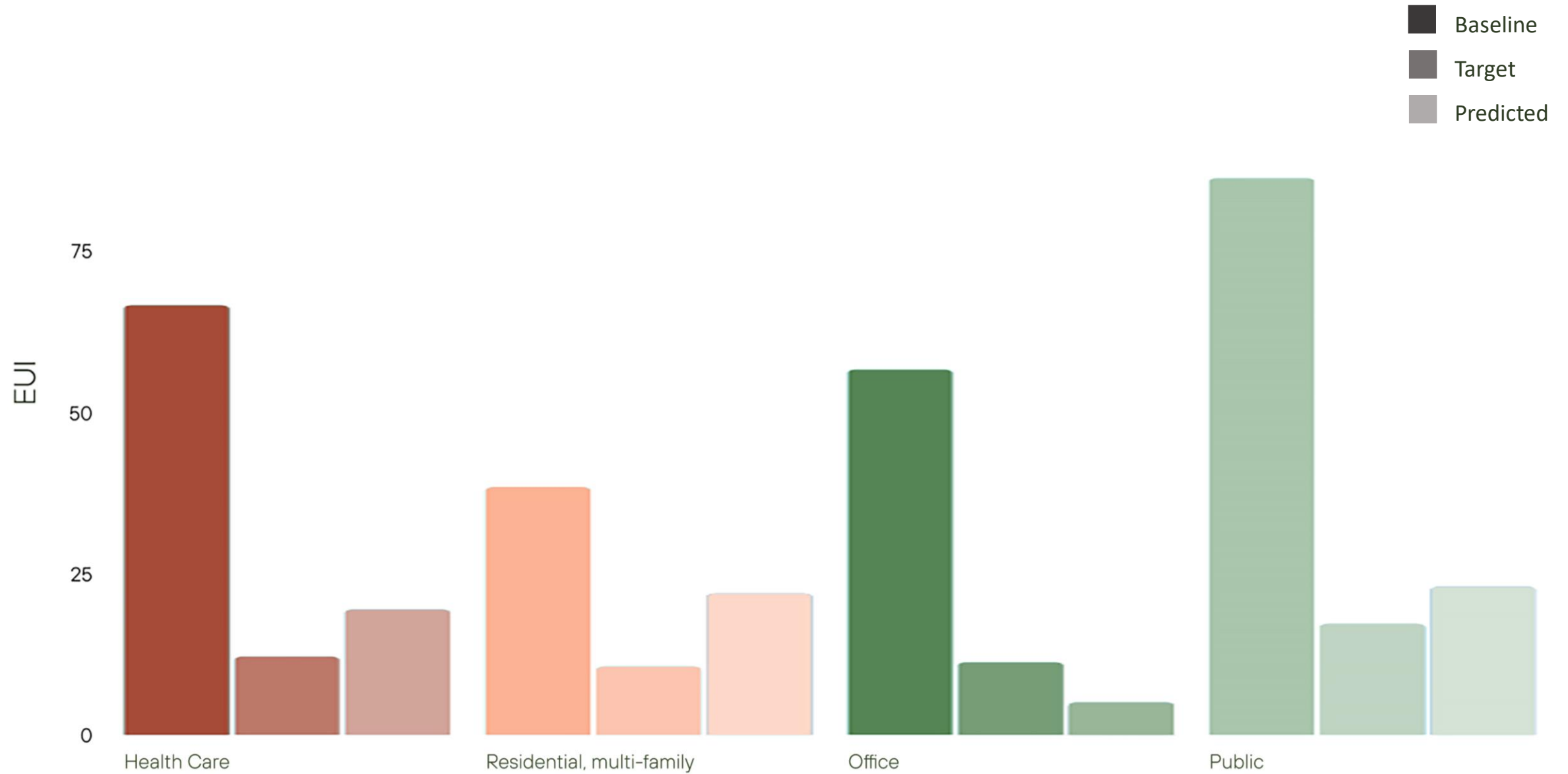
Projects by use type



Target vs Predicted EUI



Modeled Project Data




Cove.tool Case Study: “Office building”



Project page

Project Image

 Image

Max. Size: 5 MB

Project Name 

Project Number 

(Optional)

[Manage Team](#)

Building Types | Please choose up to 3 building types 



Office



Hotel



Education



Hospital



Lab




Apartments

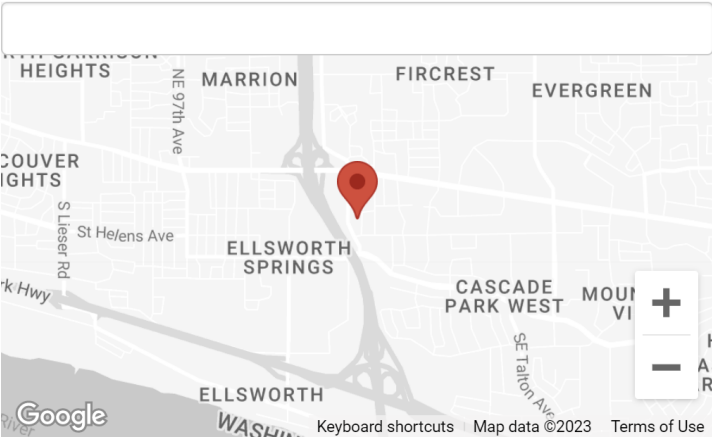


Retail



Single Family Home

Where is it located? 



Energy code 

2018 Washington State Amendments

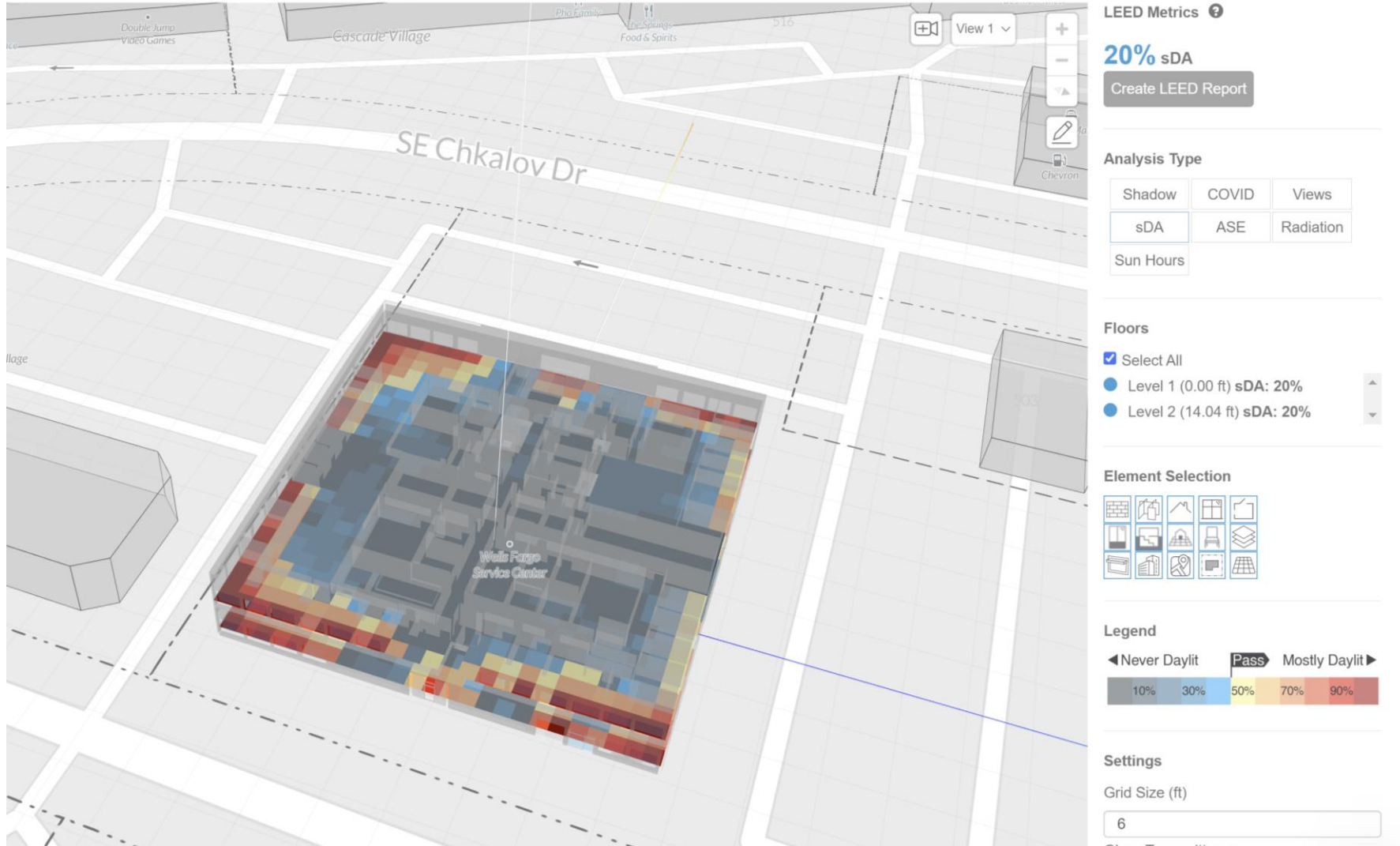
☐ Convert to template 

Measurement Units 

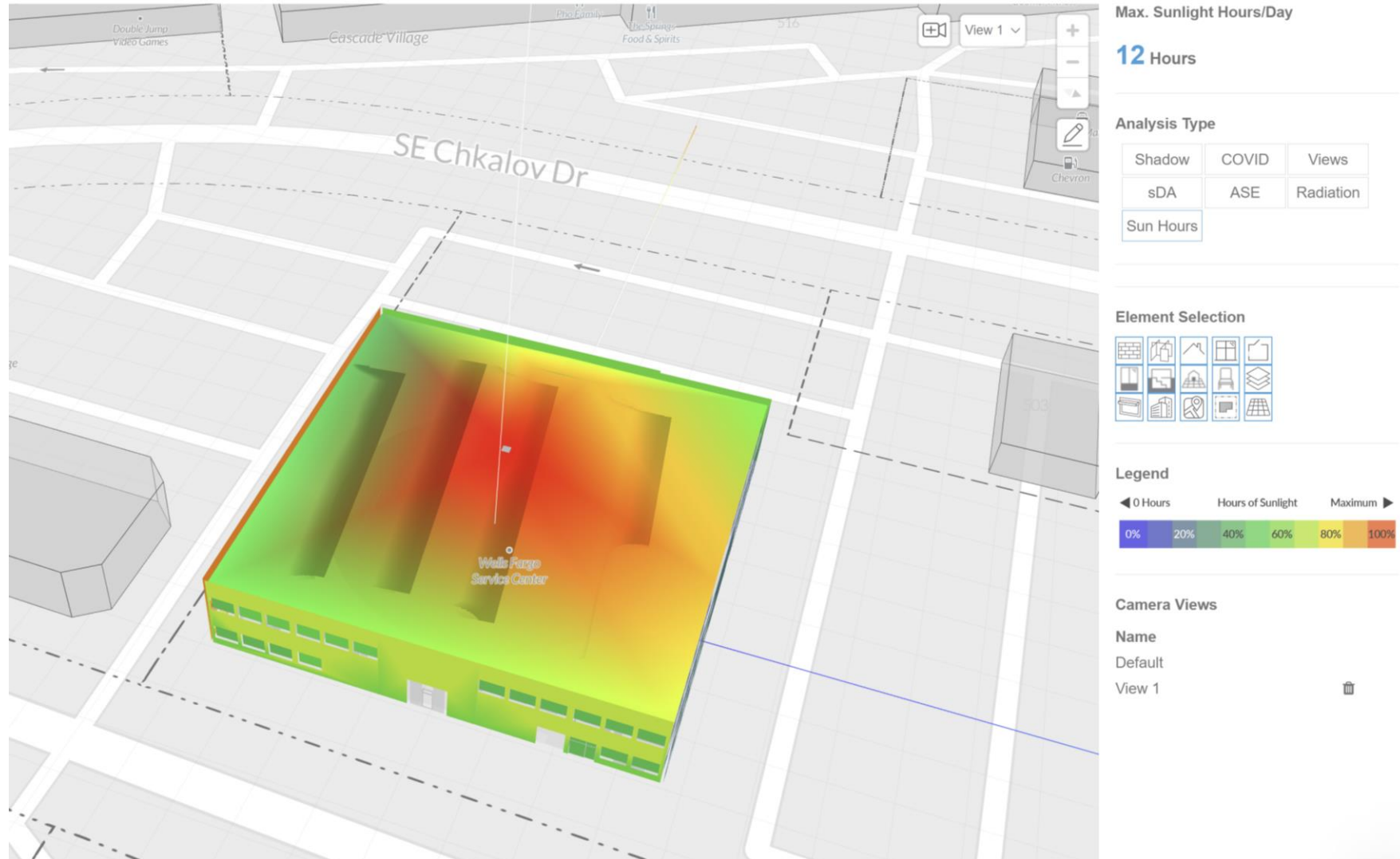
Metric

U.S.

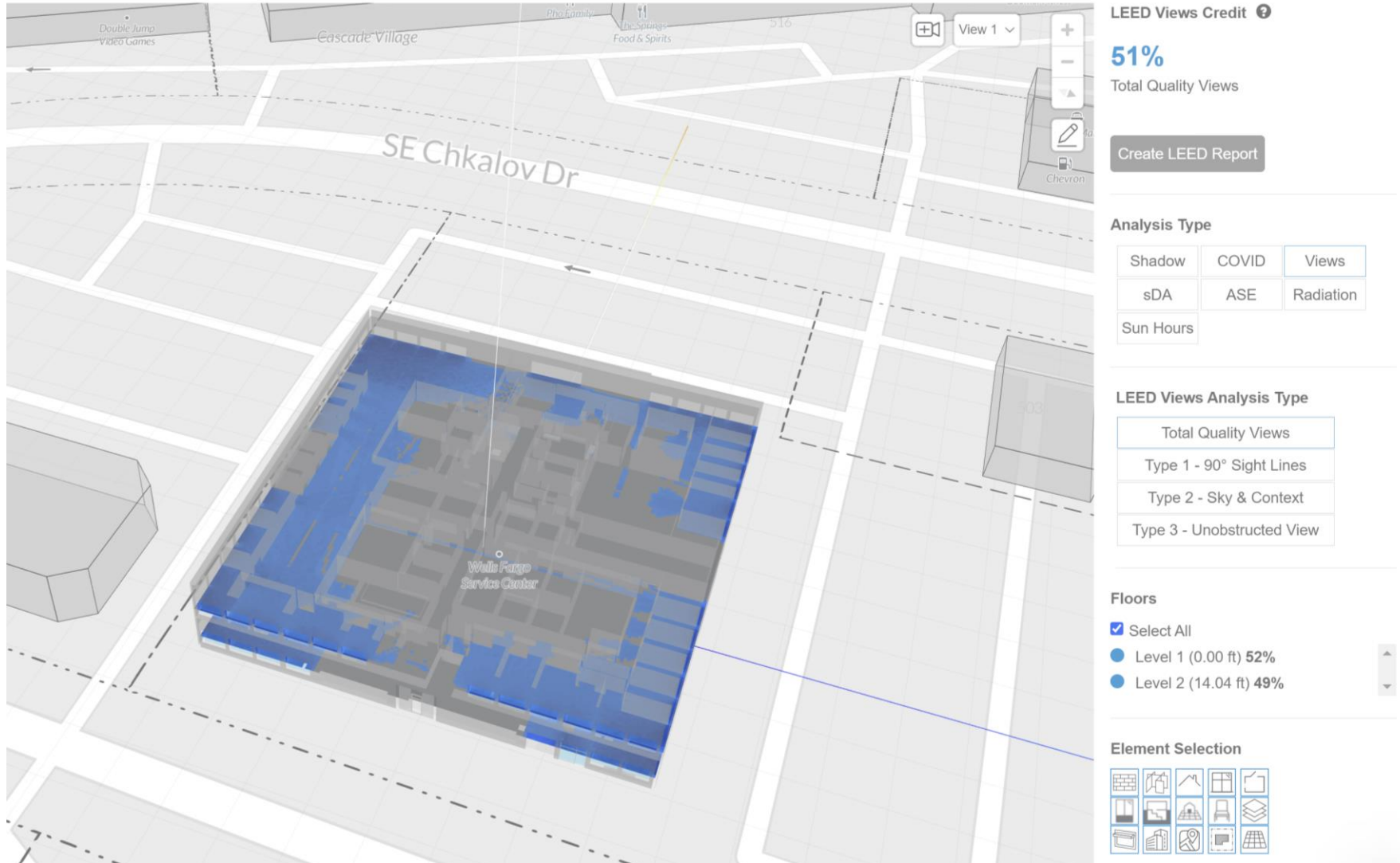
Daylighting



Sun hours

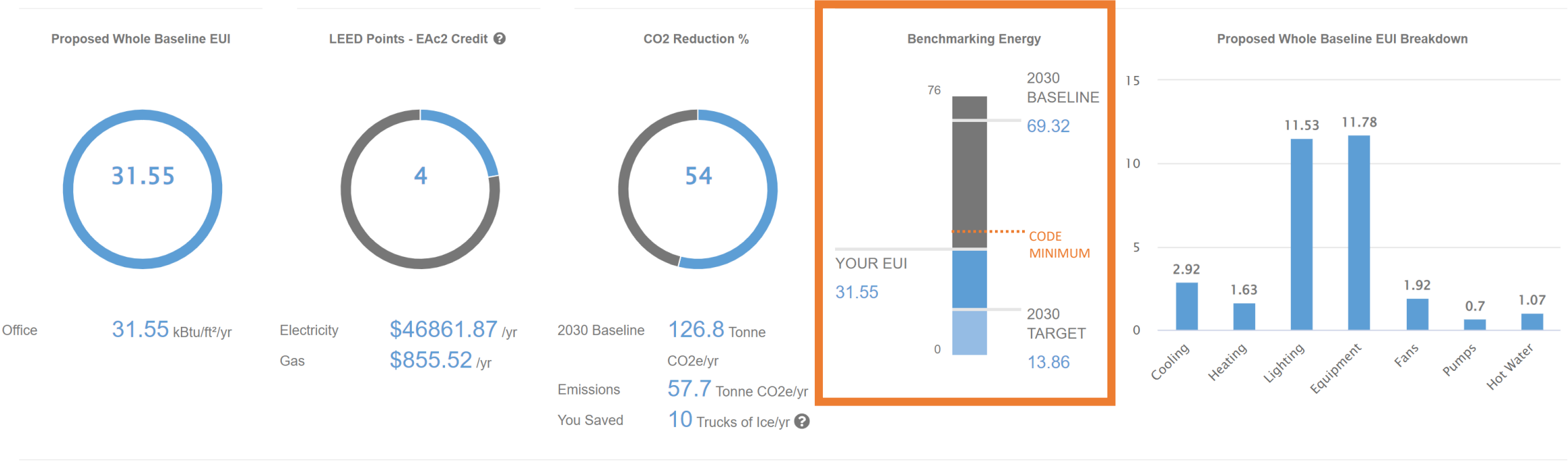


Views



Energy Analysis

Baseline Energy?



Cooling

Your cooling load is not dominating your energy use. This is because your HDD are higher than your CDD days.

Heating

Your heating load is not dominating your energy use. This makes sense - although your HDD days are higher than your CDD, the Equipment load is dominating the calculation. Look under the Usage and Schedules tab in the Engineering Inputs.

Lighting

Your lighting load contributes to 36.54% of the total EUI. You can reduce your lighting load by reducing your lighting power density and having daylight and occupancy sensors in the Engineering Inputs.

Equipment

Your equipment load is dominating your energy use. You can reduce your equipment load by reducing your appliance power density.

Hot Water

Your hot water load contributes to 3.39% of the total EUI. You can reduce your hot water load by reducing your domestic hot water demand and using a more efficient hot water generation system in Engineering Inputs.

Fans

Your fan load contributes to 6.09% of the total EUI. You can reduce your fan energy by switching your fan flow control accordingly in the Engineering Inputs. Total Outdoor Air for the project is 6076.56 CFM.

Pumps

Your pump load contributes to 2.22% of the total EUI. You can reduce your pump energy by adjusting pump control for cooling/heating in the Engineering Inputs.

Energy Analysis

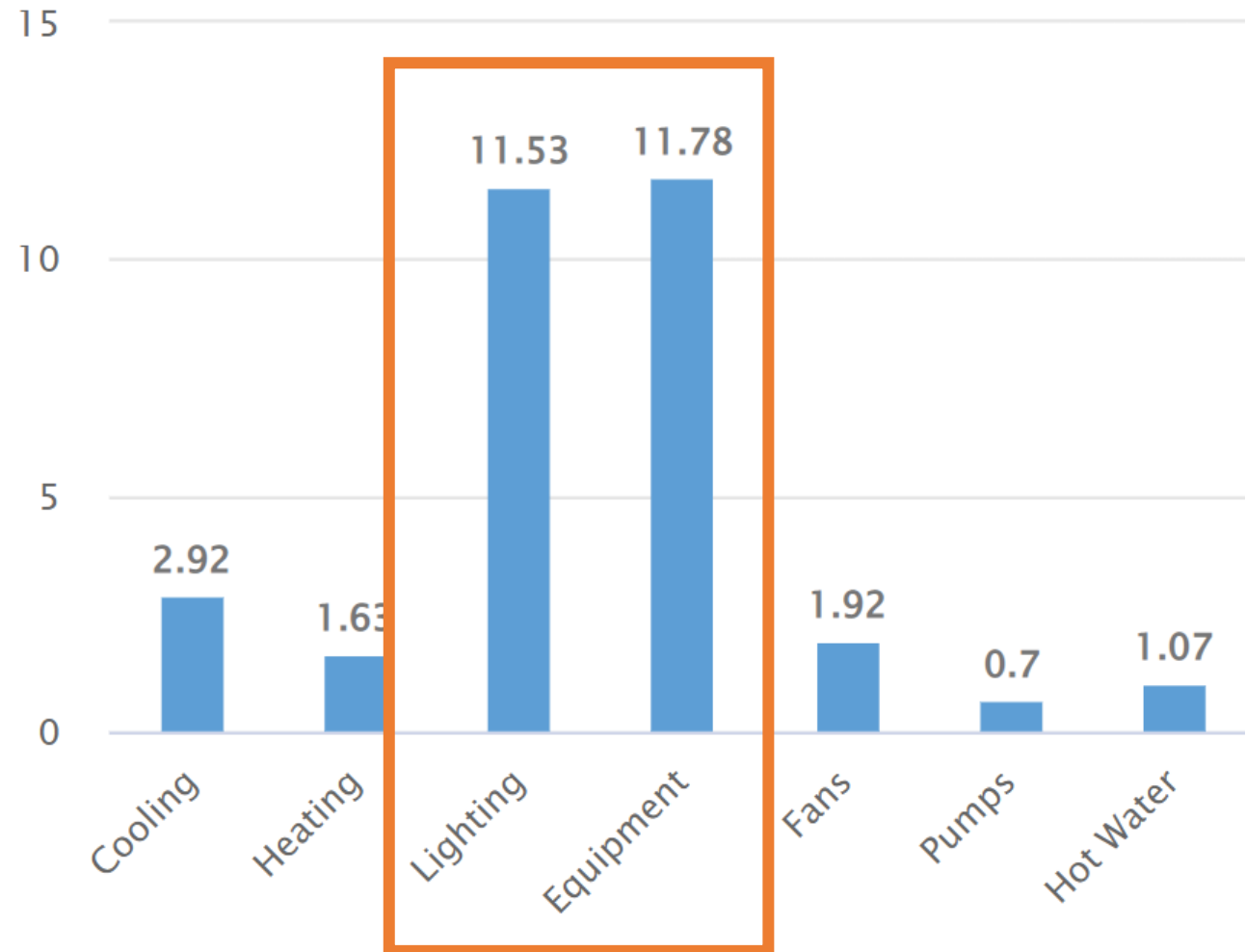
Lighting

Your lighting load contributes to 36.54% of the total EUI. You can reduce your lighting load by reducing your lighting power density and having daylight and occupancy sensors in the Engineering Inputs.

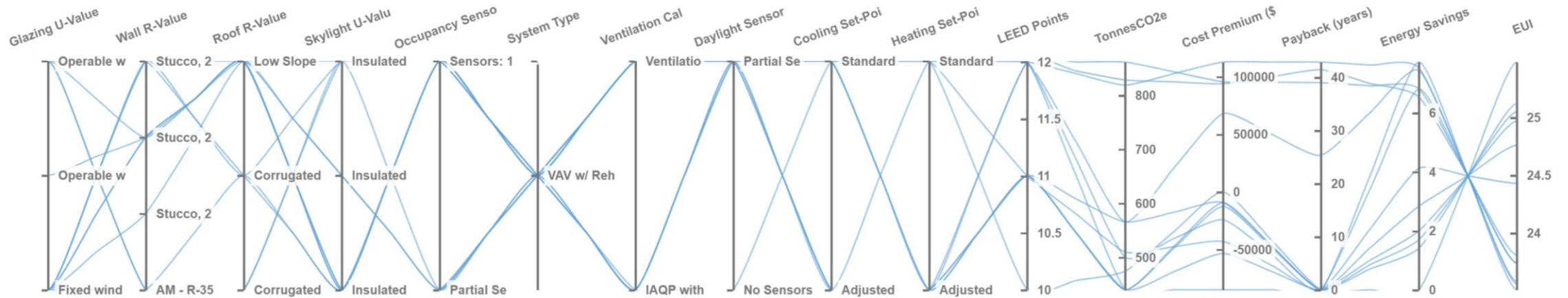
Equipment

Your equipment load is dominating your energy use. You can reduce your equipment load by reducing your appliance power density.

Proposed Whole Baseline EUI Breakdown



Optimization



Bundles Ext. Enclosure Roofing HVAC Electrical Equipment Set Points + Schedules Renewable Interior Construction Structure

Recalculate



Cost vs Energy Optimized Bundle

\$-24,204
COST PREMIUM
24
EUI
12
LEED

0.00
Payback (years)
8%
Energy Savings
500.3
CO2e (Tonnes)

Cooling Set-Point Standard
Daylight Sensors (%) Partial Sensors: 50%
Glazing U-Value Fixed window, type 15...
Heating Set-Point Standard
Occupancy Sensors (%) Sensors: 100%

Roof R-Value Low Slope Roofing, EP...
Skylight U-Value Insulated skylight, t...
System Type VAV w/ Reheat, with G...
Ventilation Calculati... IAQP with Sorbent Air...
Wall R-Value Stucco, 2 layers, on ...

Whole Building Baseline ?

\$2,051,595
COST FOR SELECTED OPTIONS
25 kBtu/ft²/yr
EUI

Baseline

\$0
COST PREMIUM
25
EUI
10
LEED

0.00
Payback (years)
0%
Energy Savings
474.14
CO2e (Tonnes)

Cooling Set-Point Standard
Daylight Sensors (%) Partial Sensors: 50%
Glazing U-Value Fixed window, type 15...
Heating Set-Point Standard
Occupancy Sensors (%) Partial Sensors: 50%

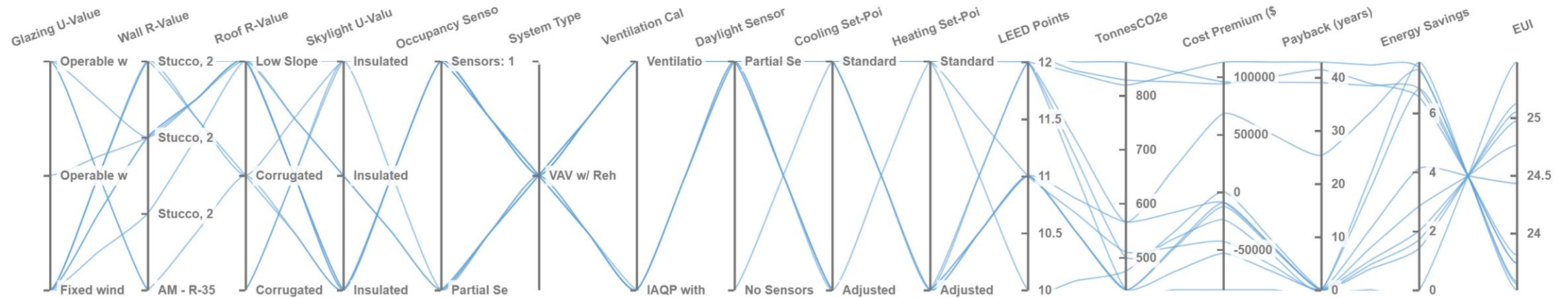
Roof R-Value Low Slope Roofing, EP...
Skylight U-Value Insulated skylight, t...
System Type VAV w/ Reheat, with G...
Ventilation Calculati... Ventilation Rate Proc...
Wall R-Value Stucco, 2 layers, on ...

Whole Building Optimized ?

\$-24,204
COST FOR SELECTED OPTIONS
24 kBtu/ft²/yr
EUI

CREATE REPORT

Optimization



Bundles Ext. Enclosure Roofing HVAC Electrical Equipment Set Points + Schedules Renewable Interior Construction Structure

Recalculate



Cost vs Energy Optimized Bundle

\$-24,204	0.00	Cooling Set-Point	Standard	Roof R-Value	Low Slope Roofing, EP...
COST PREMIUM	Payback (years)	Daylight Sensors (%)	Partial Sensors: 50%	Skylight U-Value	Insulated skylight, t...
24	8%	Glazing U-Value	Fixed window, type 15...	System Type	VAV w/ Reheat, with G...
EUI	Energy Savings	Heating Set-Point	Standard	Ventilation Calculati...	IAQP with Sorbent Air...
12	500.3	Occupancy Sensors (%)	Sensors: 100%	Wall R-Value	Stucco, 2 layers, on ...
LEED	CO2e (Tonnes)				

Baseline

\$0	0.00	Cooling Set-Point	Standard	Roof R-Value	Low Slope Roofing, EP...
COST PREMIUM	Payback (years)	Daylight Sensors (%)	Partial Sensors: 50%	Skylight U-Value	Insulated skylight, t...
25	0%	Glazing U-Value	Fixed window, type 15...	System Type	VAV w/ Reheat, with G...
EUI	Energy Savings	Heating Set-Point	Standard	Ventilation Calculati...	Ventilation Rate Proc...
10	474.14	Occupancy Sensors (%)	Partial Sensors: 50%	Wall R-Value	Stucco, 2 layers, on ...
LEED	CO2e (Tonnes)				

Whole Building Baseline ?

\$2,051,595
COST FOR SELECTED OPTIONS
25 kBtu/ft²/yr
EUI

Whole Building Optimized ?

\$-24,204
COST FOR SELECTED OPTIONS
24 kBtu/ft²/yr
EUI

CREATE REPORT

Optimization

Whole Building Baseline ?

\$2,051,595

COST FOR SELECTED OPTIONS

25 kBtu/ft²/yr

EUI

Whole Building Optimized ?

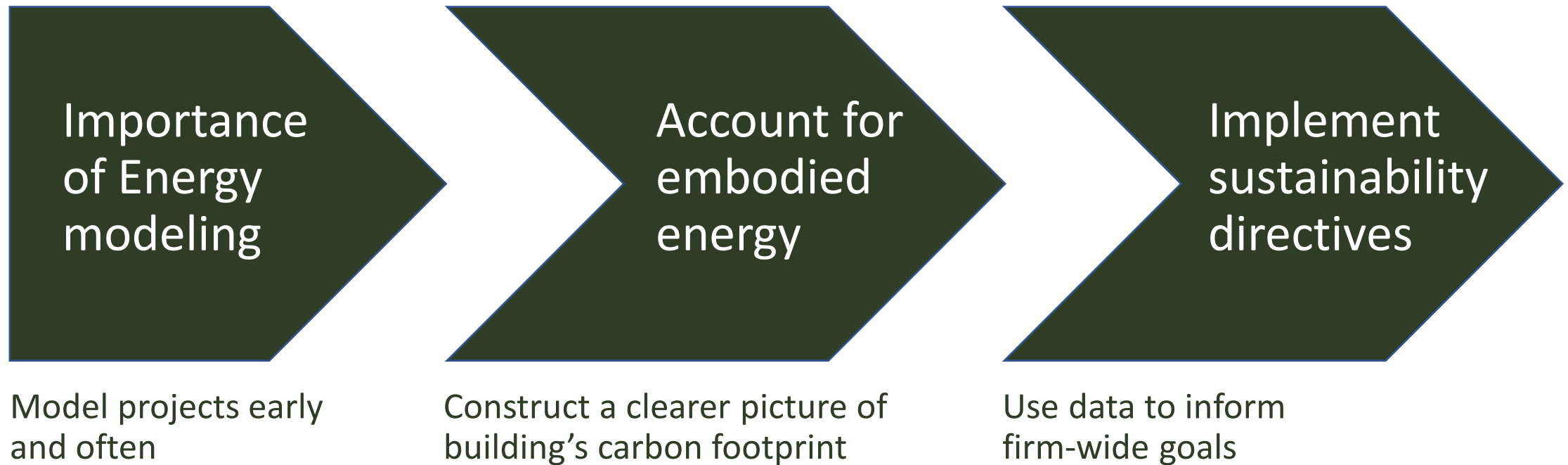
\$-24,204

COST FOR SELECTED OPTIONS

24 kBtu/ft²/yr

EUI

Lessons Learned & Future Plans



Thank you!