BRIIC

Net Zero Emerging Leaders Internship

BRIC

Creating Sustainable Buildings and a Sustainable Culture

BRIC Overview

BUILDING RELATIONSHIPS | INSPIRING COMMUNITIES

Educational Design Firm

47 Employees

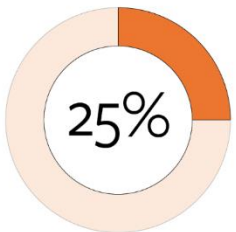
BRIC and Sustainability

BRIC Architecture is a **community-focused** architecture firm. Through value-driven conversations, we collaborate with communities to create spaces that **inspire engagement, exploration, growth, and inclusivity for generations**. We believe the long-term stewardship of the natural environment - both locally and globally - is one of our inherent responsibility as designers. As we renovate and design new buildings, we are recognizing the steps needed to reach a **path to net zero** and look forward to accomplishing these goals.

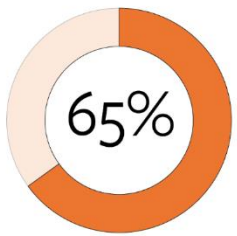
Sustainability and Schools

WHY GREEN SCHOOL DESIGN MATTERS

- Students and faculty spend **85%-90%** of their time indoors, where the indoor air quality can be up to 100 times more harmful than outdoors.
- Over **70%** of executives reported that green schools reduced student absenteeism and improved student performance.[1]



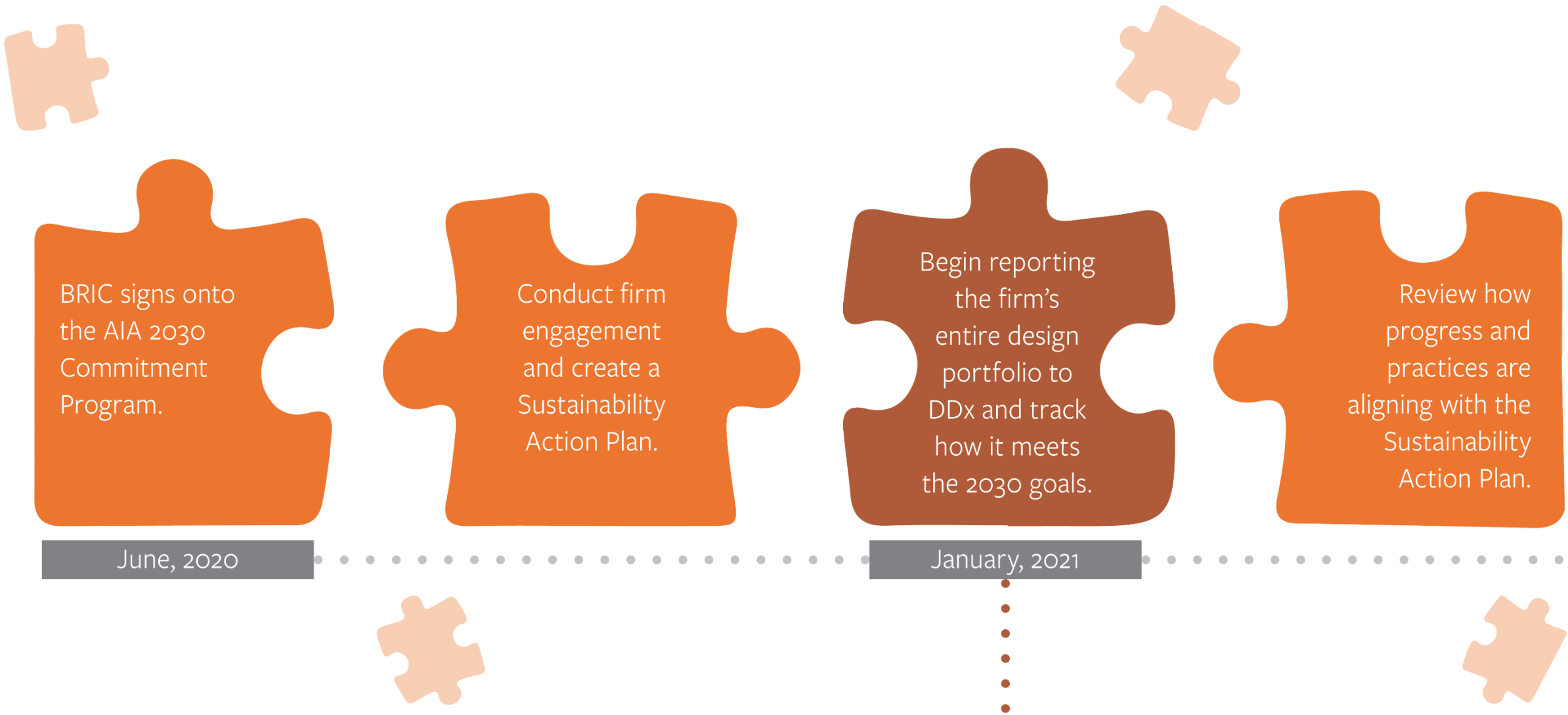
Rate in which the classroom environment can affect a child's academic progress over a year.



Reduction in asthma cases among elementary school students when indoor environment quality improves.

1 Kats, Gregory. (2006). Greening America's Schools: Costs and Benefits.

BRIC's AIA 2030 Commitment



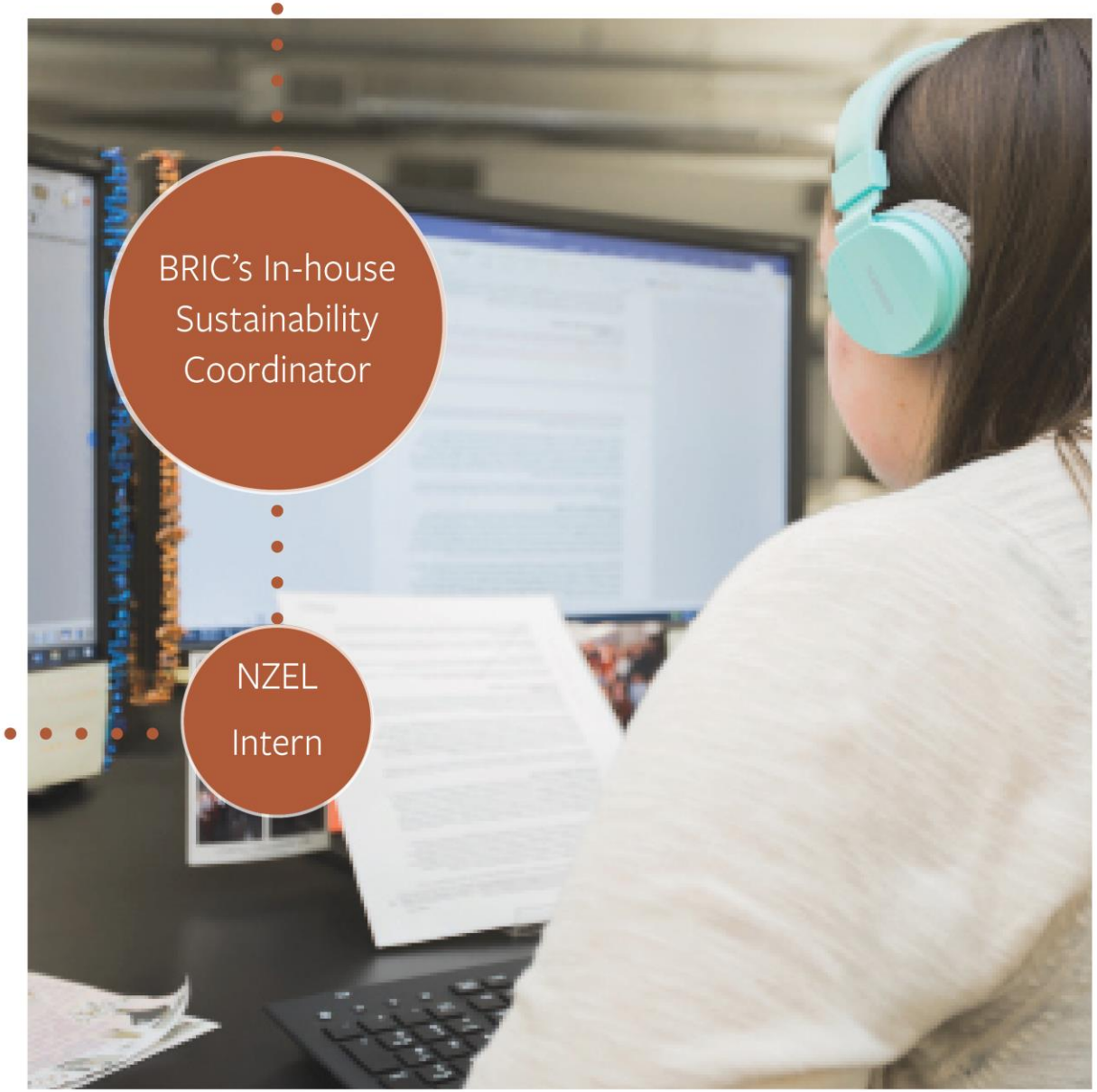
BRIC's AIA 2030 Commitment

Internship Goals

#1 Establish a method to record project information.

#2 Log all applicable projects into DDx and review results.

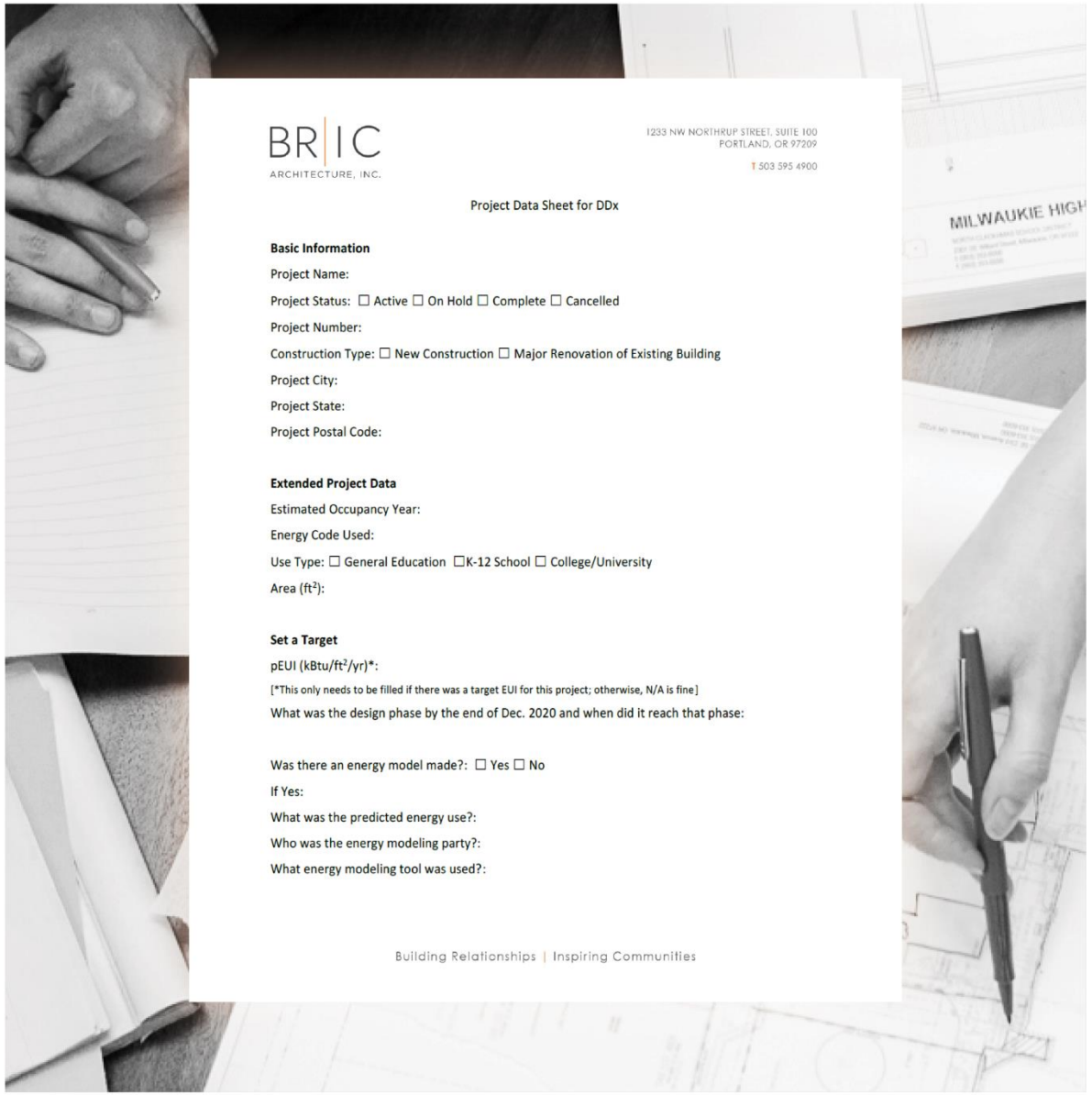
#3 Research performance modeling software.



BRIC 2020 Portfolio

RECORDING PROCESS

- Generated a template that lists the required information from DDx for the firm to use.
- Attended AIA 2030 Open Office Hours to learn how to efficiently use this research tool.
- Recorded projects to DDx and updated whenever new information was provided.



BRIC
ARCHITECTURE, INC.

1233 NW NORTHRUP STREET, SUITE 100
PORTLAND, OR 97209
T 503 595 4900

Project Data Sheet for DDx

Basic Information

Project Name:
Project Status: ☐ Active ☐ On Hold ☐ Complete ☐ Cancelled
Project Number:
Construction Type: ☐ New Construction ☐ Major Renovation of Existing Building
Project City:
Project State:
Project Postal Code:

Extended Project Data

Estimated Occupancy Year:
Energy Code Used:
Use Type: ☐ General Education ☐K-12 School ☐ College/University
Area (ft^2):

Set a Target

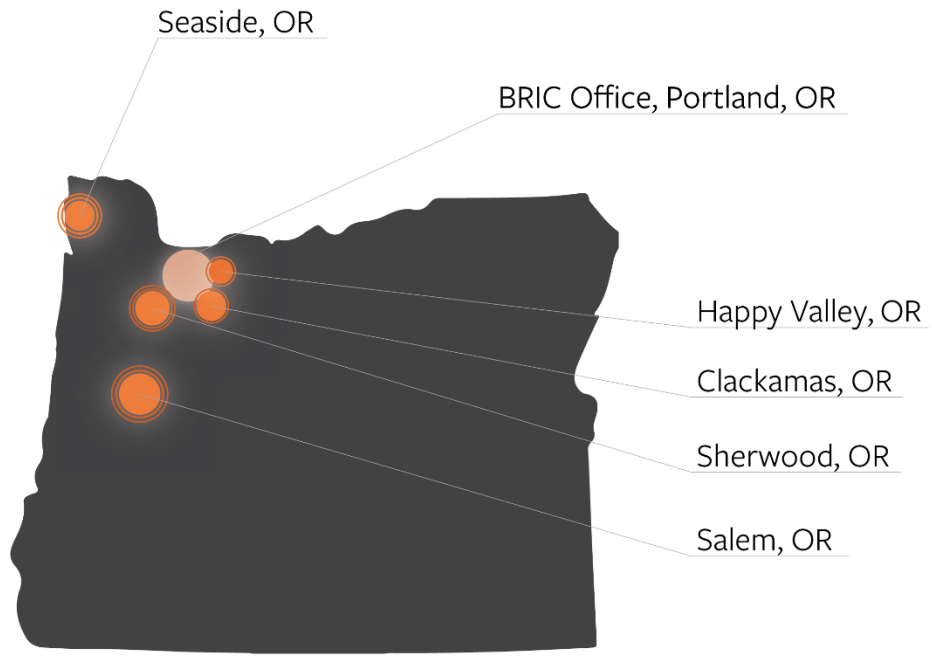
pEUI ($kBtu/ft^2/yr$)*:
[*This only needs to be filled if there was a target EUI for this project; otherwise, N/A is fine]
What was the design phase by the end of Dec. 2020 and when did it reach that phase:

Was there an energy model made?: ☐ Yes ☐ No
If Yes:
What was the predicted energy use?:
Who was the energy modeling party?:
What energy modeling tool was used?:

Building Relationships | Inspiring Communities

BRIC 2020 Portfolio

PROJECT OVERVIEW

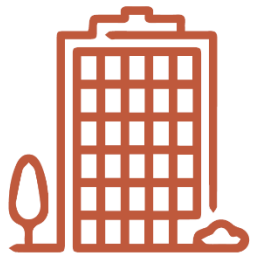


19 Projects Recorded

4 - Elementary

4 - Middle School

8 - High School



3 - Other

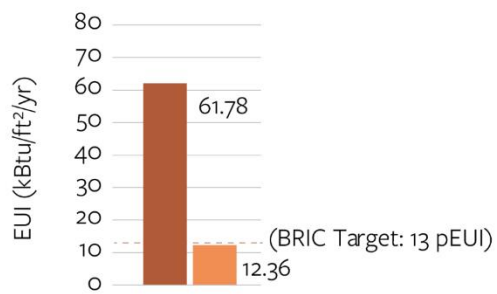
BRIC 2020 Portfolio

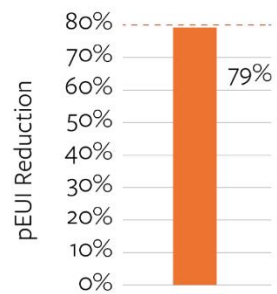
RESULTS

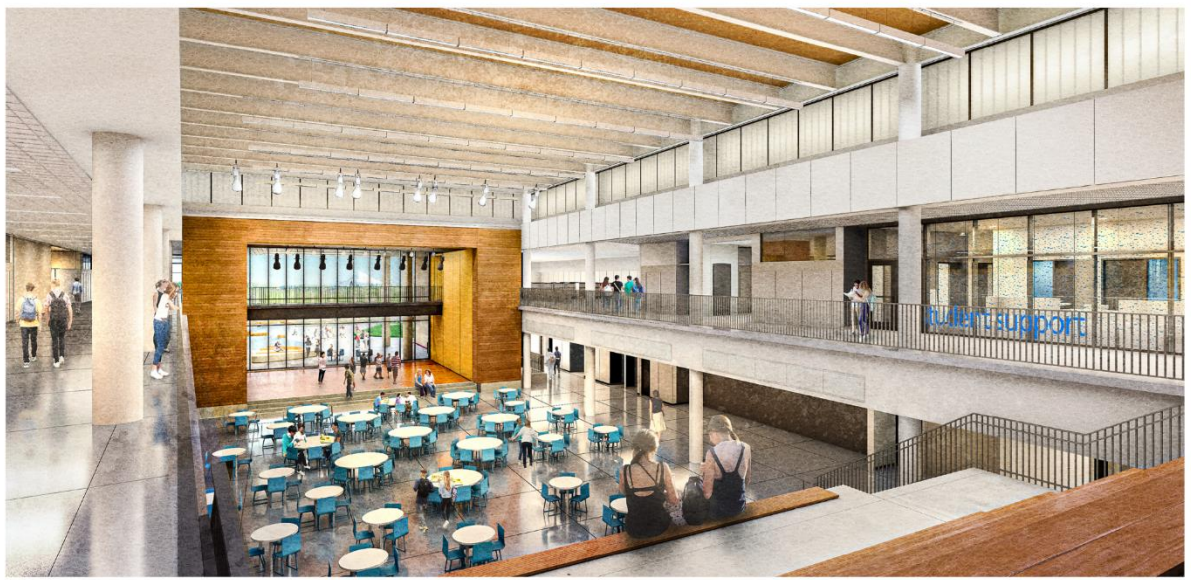
Case Study:

GARDINER MIDDLE SCHOOL

- Oregon City, Oregon
- Area: 150,000 ft²
- Path to net zero project
- Early discussion about EUI and energy modeling
- Focus on energy conservation: water, lighting, electrical, and HVAC
- Renewable energy: solar strategies
- 79% EUI Reduction

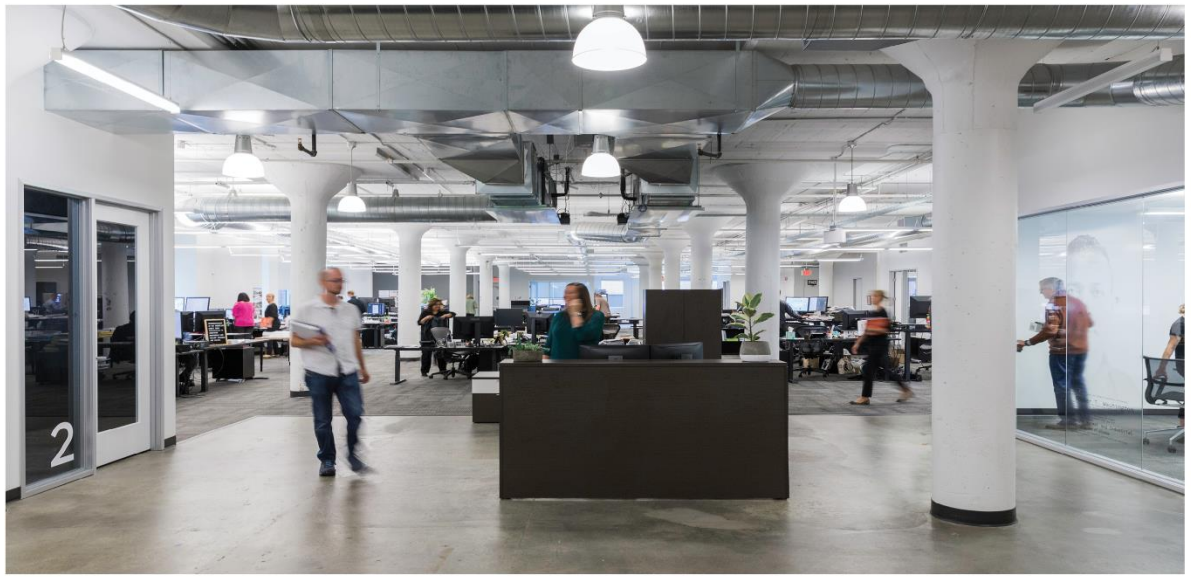




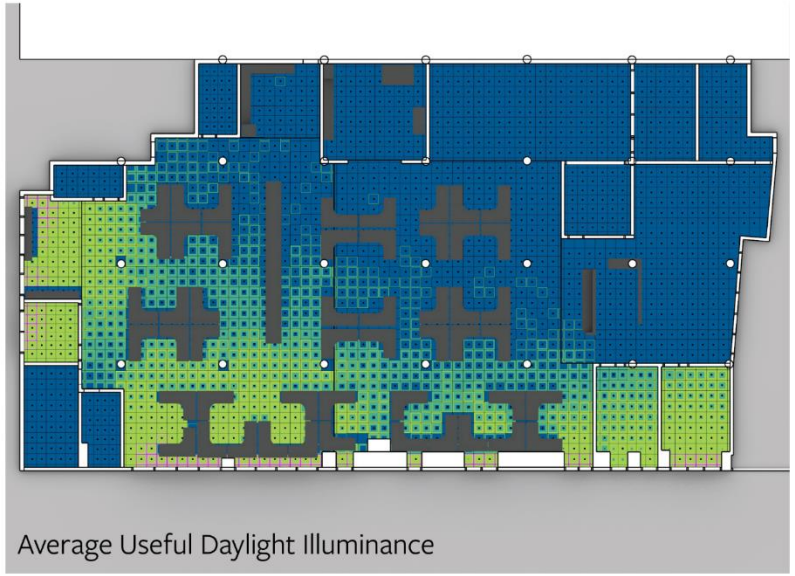


Performance Modeling Comparison

AN ANALYSIS OF THE BRIC OFFICE

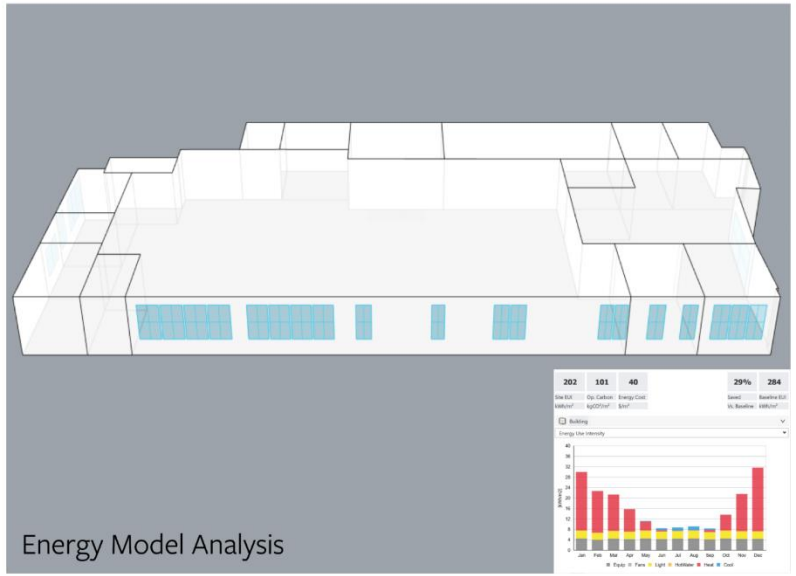


PERFORMANCE MODELING - CLIMATE STUDIO

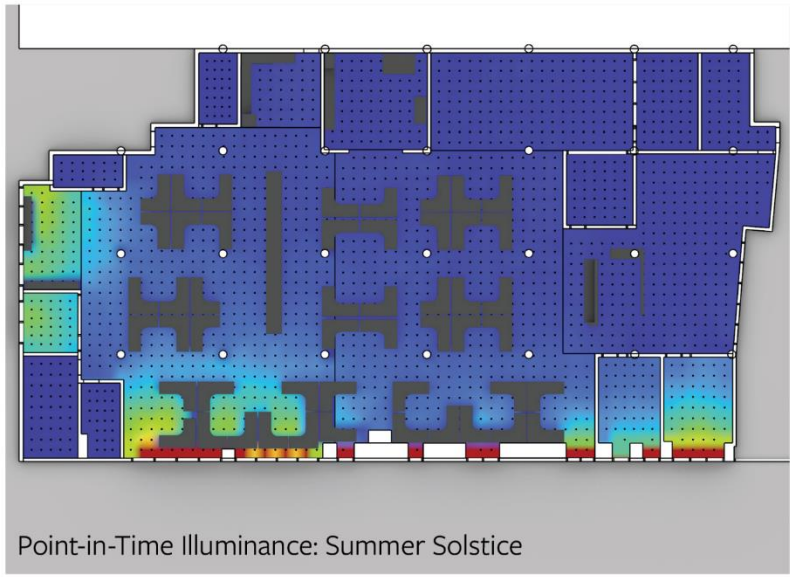


Average Useful Daylight Illuminance

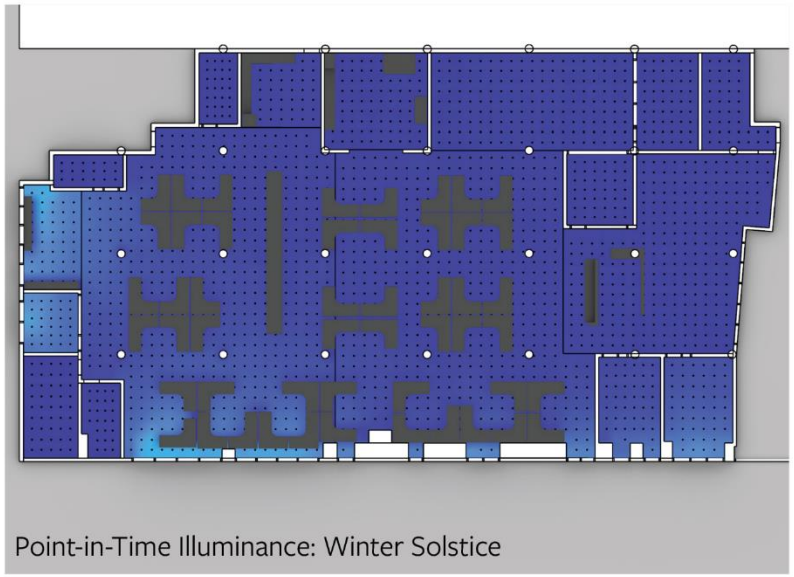
Annual Glare



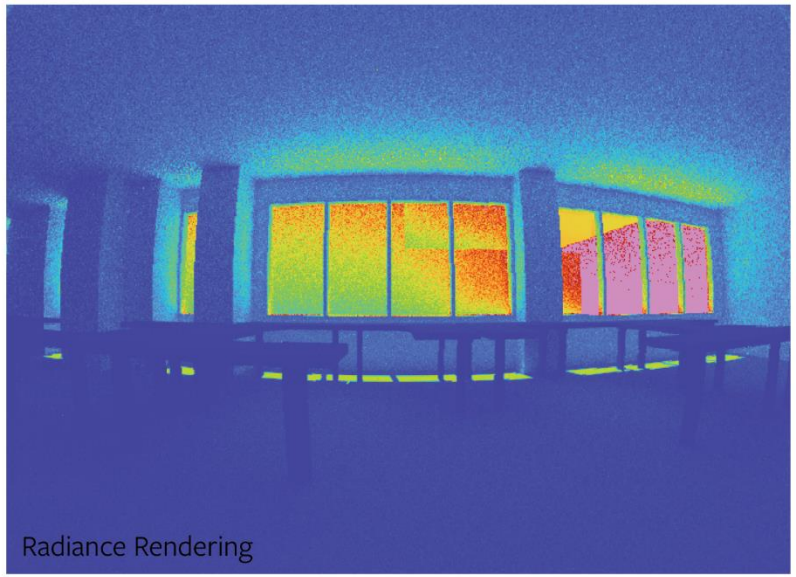
Energy Model Analysis



Point-in-Time Illuminance: Summer Solstice

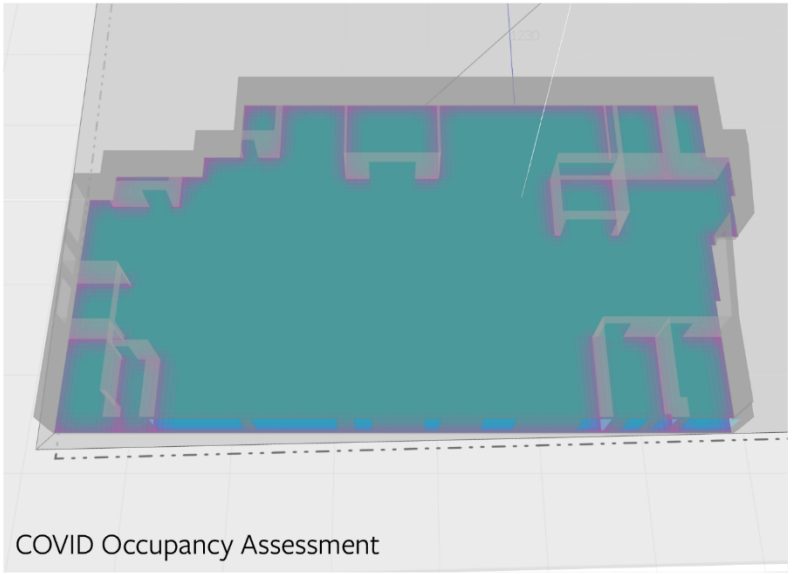


Point-in-Time Illuminance: Winter Solstice



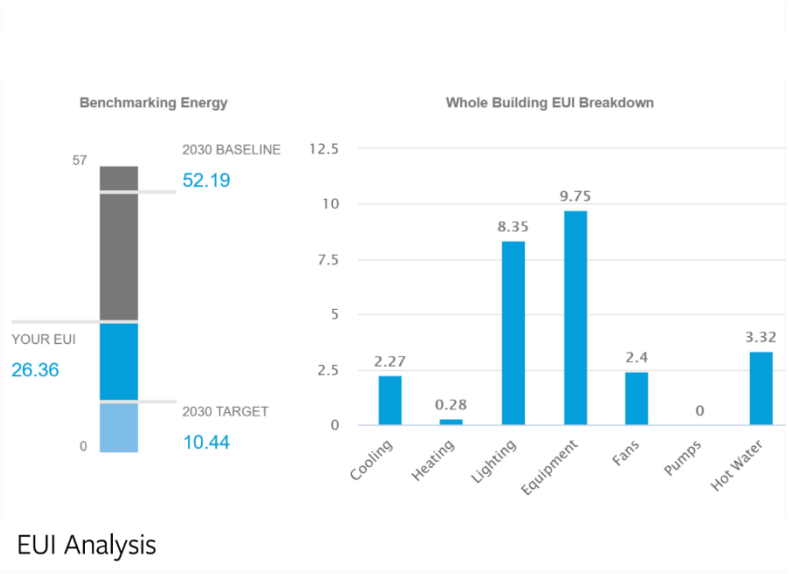
Radiance Rendering

PERFORMANCE MODELING - COVE.TOOL

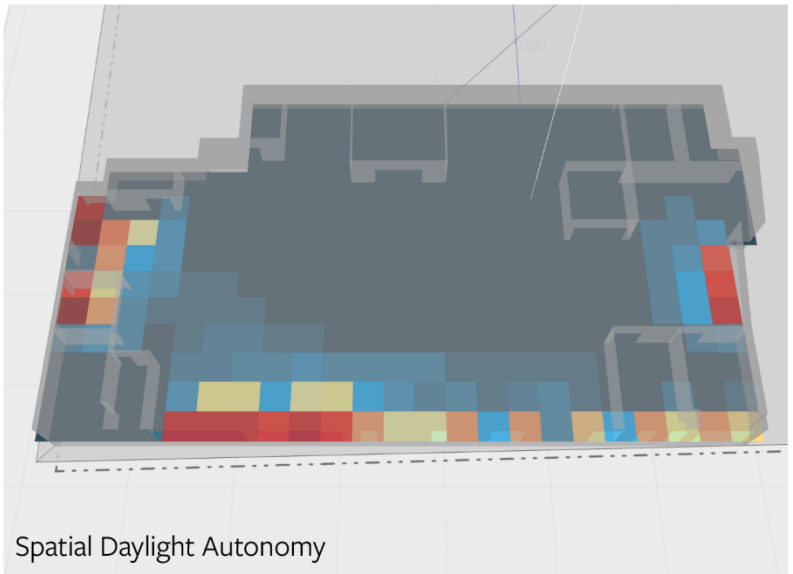


COVID Occupancy Assessment

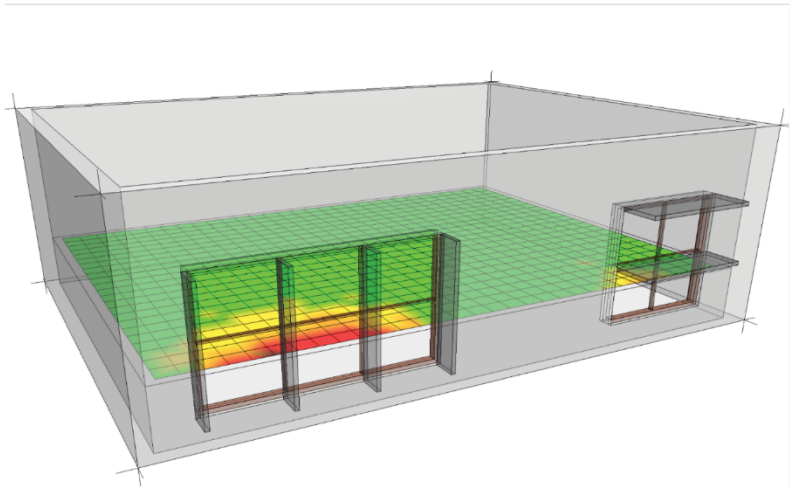
Annual Sun Exposure



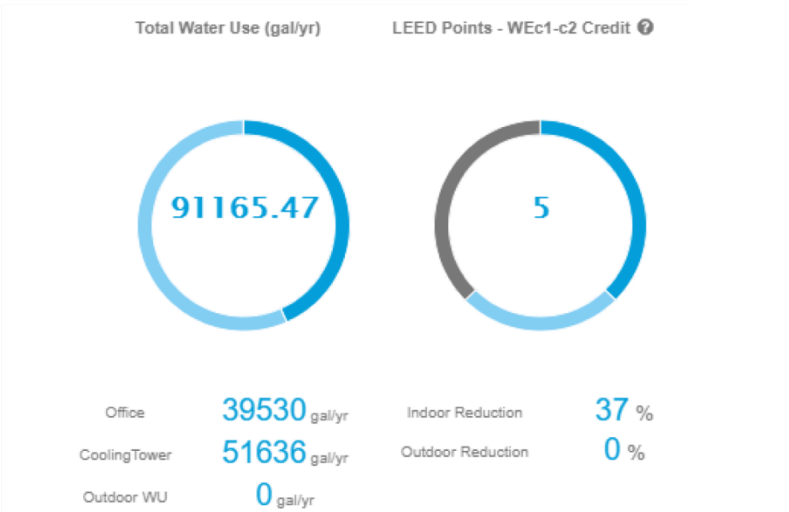
EUI Analysis



Spatial Daylight Autonomy



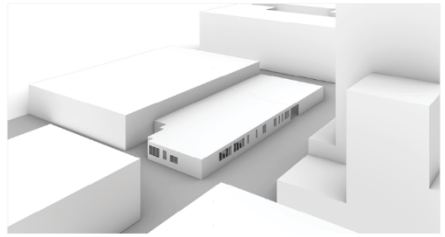
Shoe-box Model for Facade Studies



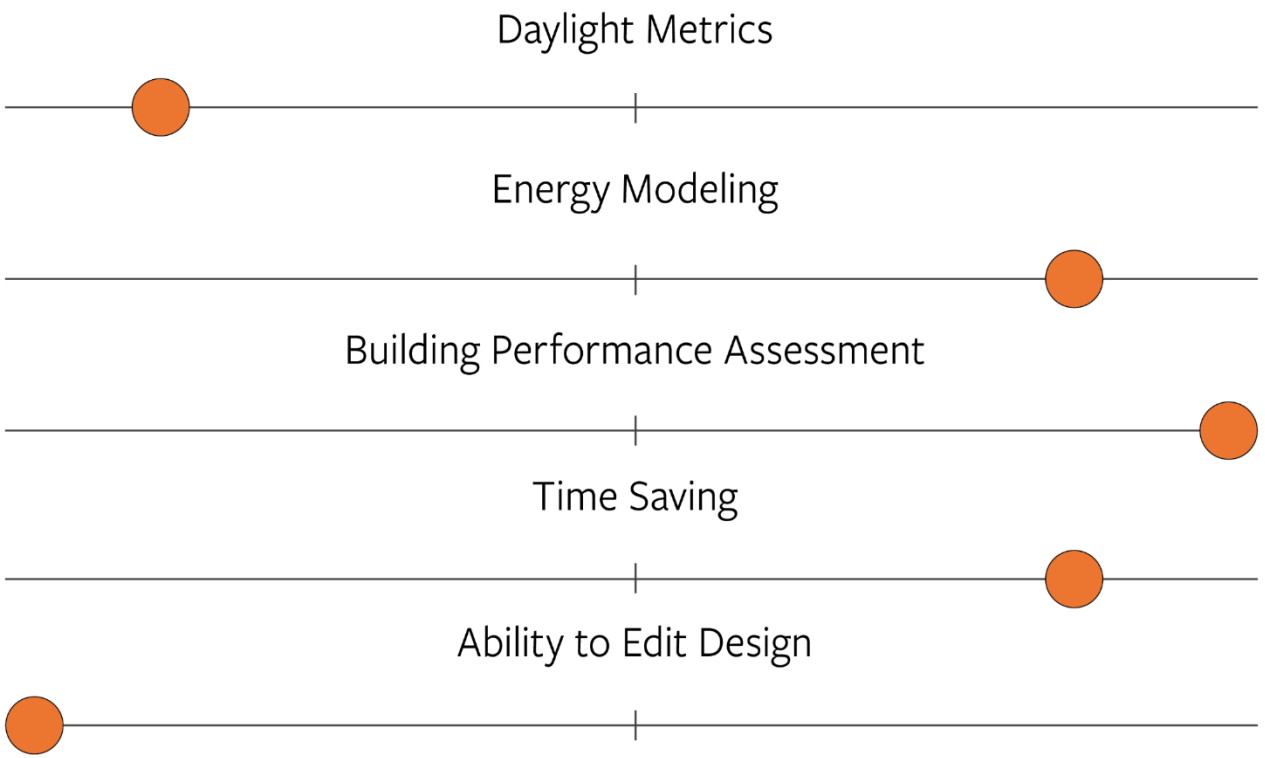
Water Use Analysis

PERFORMANCE MODELING COMPARISON

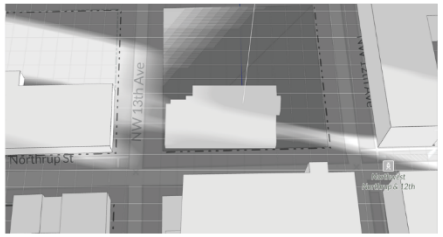
Climate Studio



- Plugin only for Rhino.
- Allows more freedom to alter the design.
- Offers both yearly and specific dates in time analysis.



cove.tool



- Web application and plugin for Rhino, Revit, Sketchup, and other software.
- Offers in depth analysis of results and recommendations.

Next Steps

#1 Standardize energy modeling and EUI tracking throughout the design process.

#2 Develop a method to track renewable energy sources, predicted lighting power density, and embodied carbon.

#3 Maintain progress to the 2030 Challenge.

Thank You