

BORA

Net Zero Emerging Leaders Internship
2024

Niusha Manavi

BORA

About Me

Born and Raised in Tehran-Iran

Bachelor of Molecular and Cellular
Biology/ Genetics from IAUTMU

Candidate for Master of Architecture
(M.Arch) at Portland State University



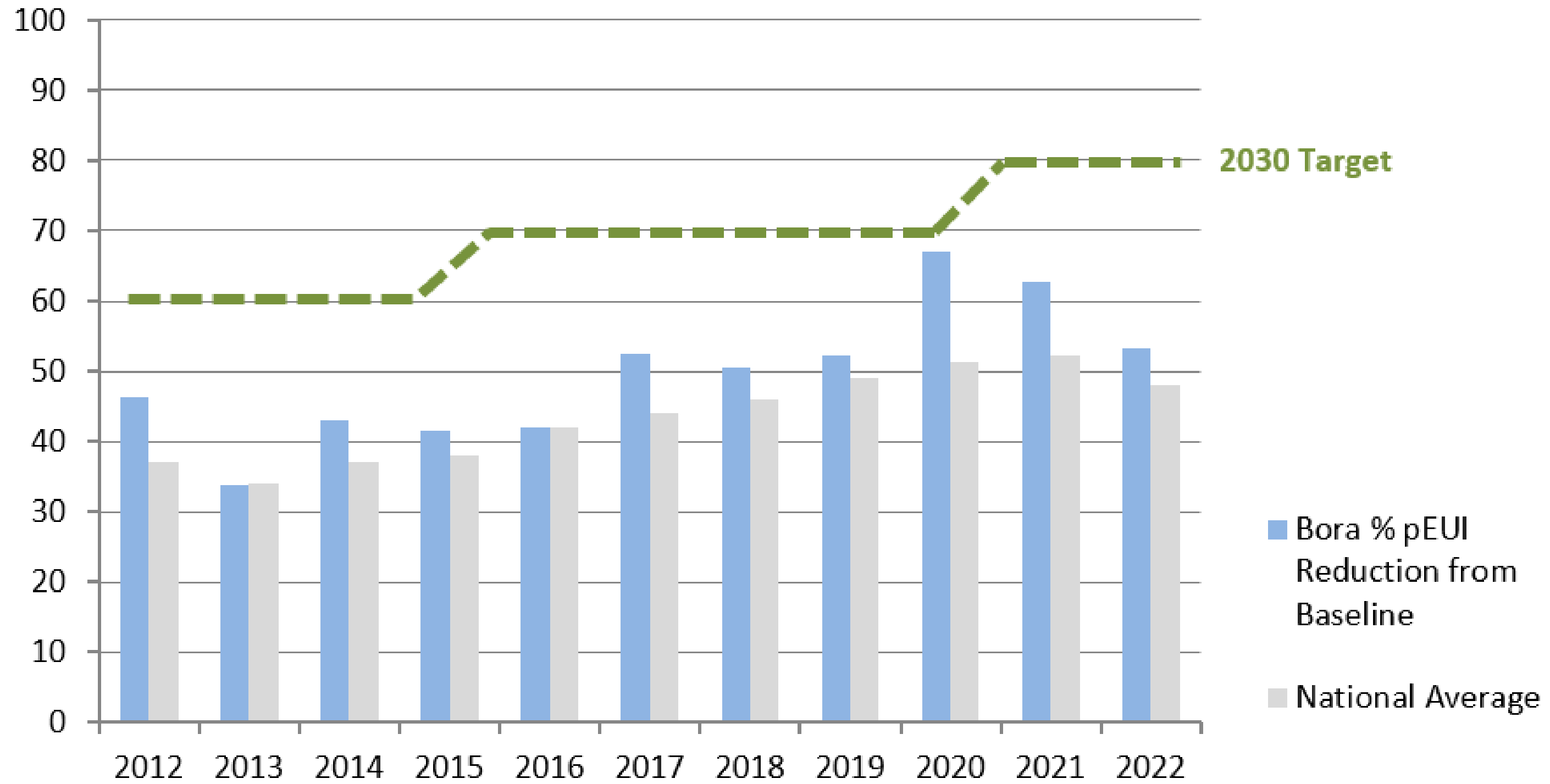
BORA | Firm Vision / Mission

We are committed to:

- A researched, achievable path to net zero energy and carbon
- Design that anticipates and mitigates future risk
- Measurably superior indoor air quality
- A building industry free of specific known toxins
- An inclusive design process that promotes diversity and respects lived experiences
- An expanded approach to design that embraces community partnerships to ensure better outcomes



Bora 2030 Commitment Progress

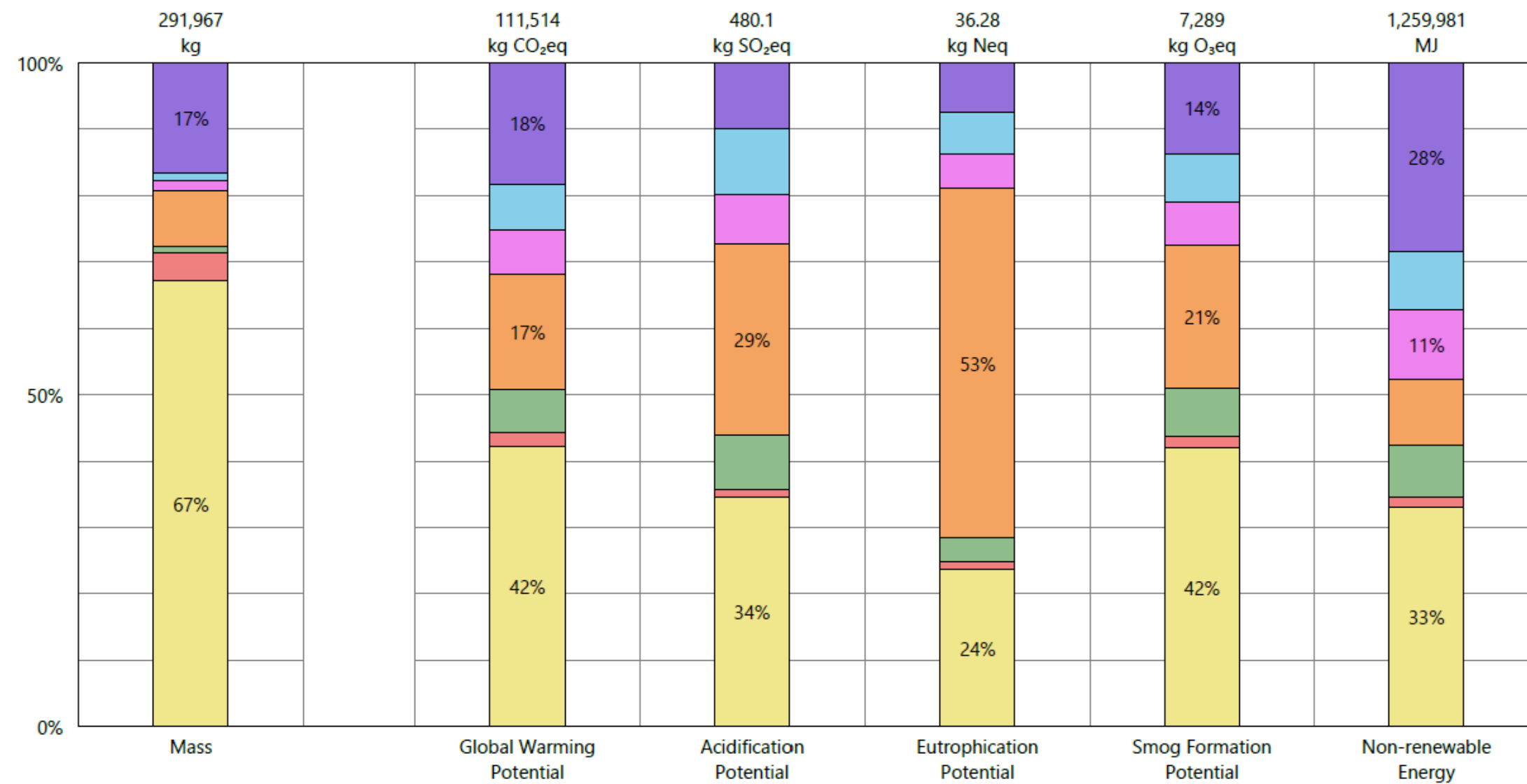


Tally

We utilized Tally LCA to compute the Carbon Embodied of the building during the design phase.

- User Friendly
- Comprehensive
- Limited
- 3D Model Dependent
- Efficient Reporting

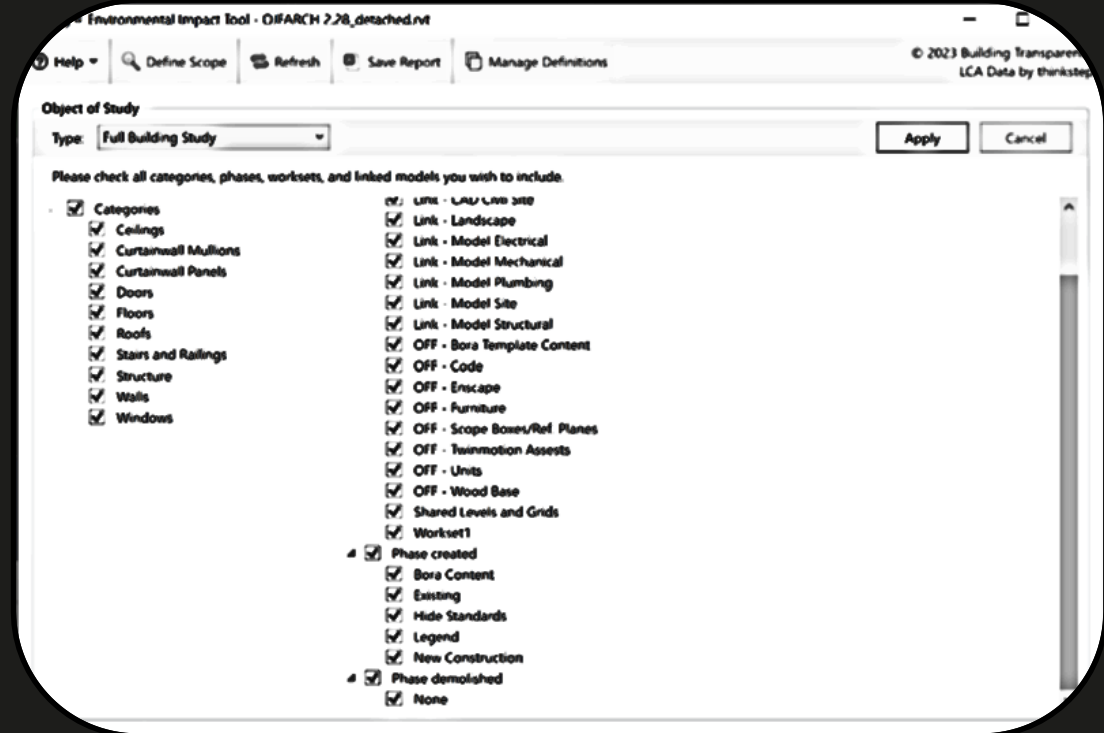
Results per Division



Process of using Tally for Measuring Carbon Footprint

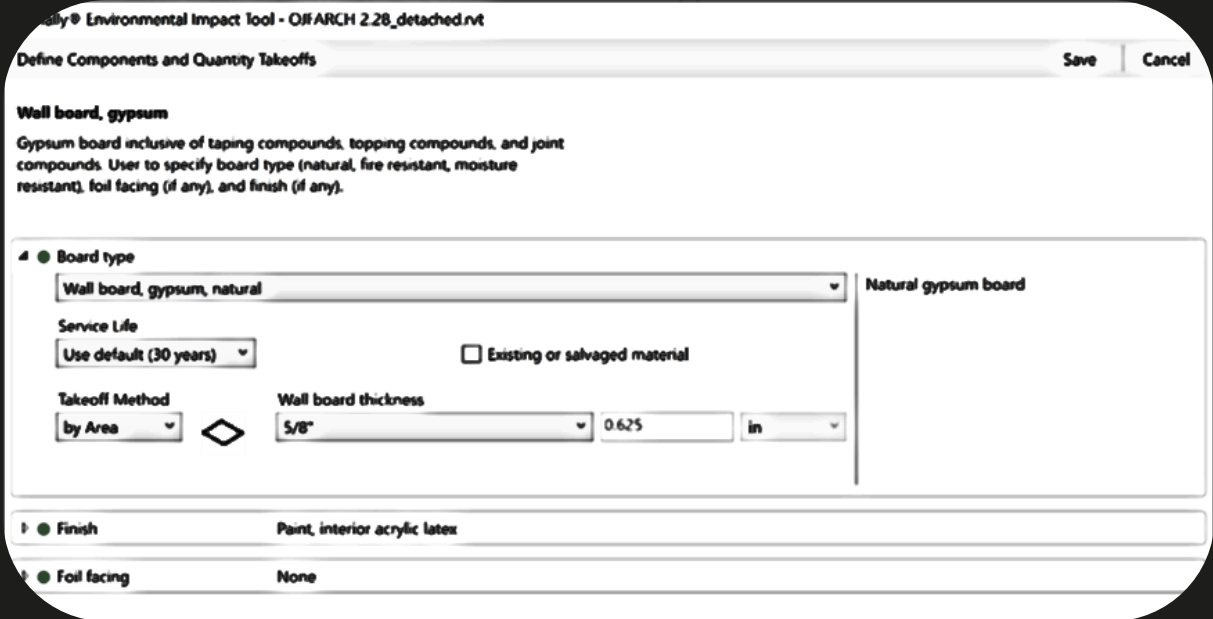
1. Data Collection

Importing Revit Model into Tally.
Using GaBi data base of material.



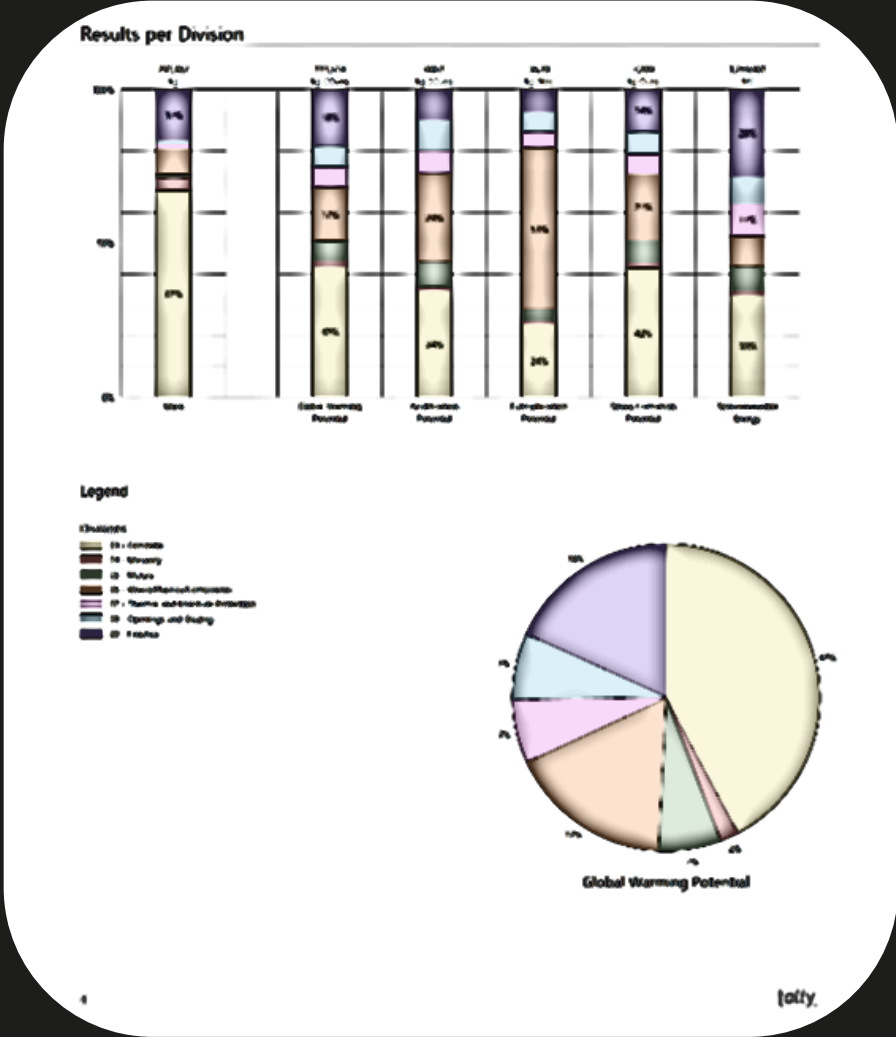
2. Calculation

Tally will perform calculations based on the Revit model and GaBi data.



3. Analysis

Tally analyzes data based on different categories and different life cycle stages.



Case Studies

Multnomah County Library St. John's →

- Renovation + New Construction
- 7,120 SF
- Mass Timber
- 112,286 KgCO₂eq

Multnomah County Library Belmont →

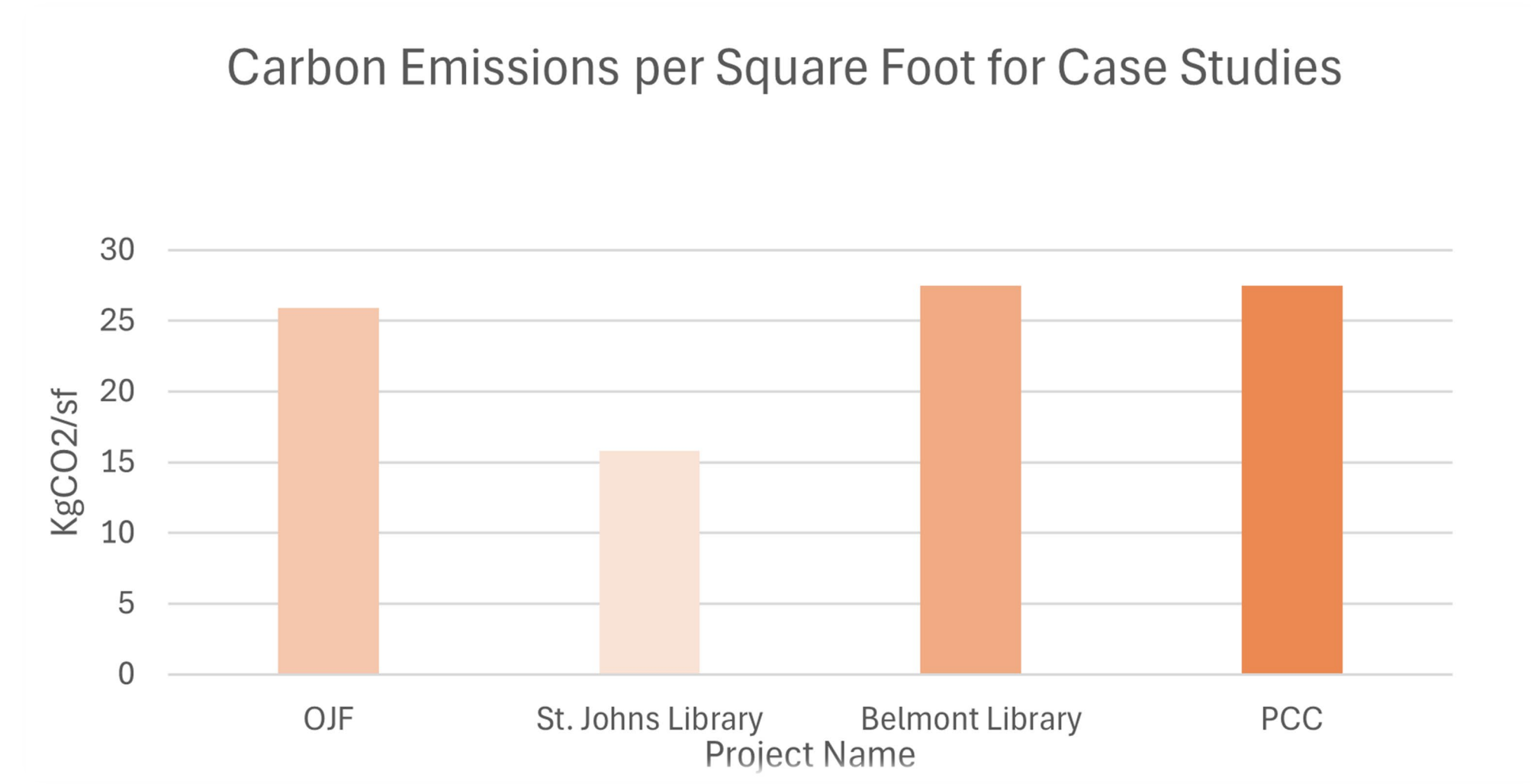
- Renovation + New Construction
- 17,375 SF
- Mass Timber
- 477,373 KgCO₂eq

OJF / PCC SE Housing →

- New Construction
- 112,000 SF
- Wood-Stick Frame
- 2,898,503 KgCO₂eq

Portland Community College Opportunity Center →

- New Construction
- 50,806 SF
- Mass Timber
- 1,163,112 KgCO₂eq

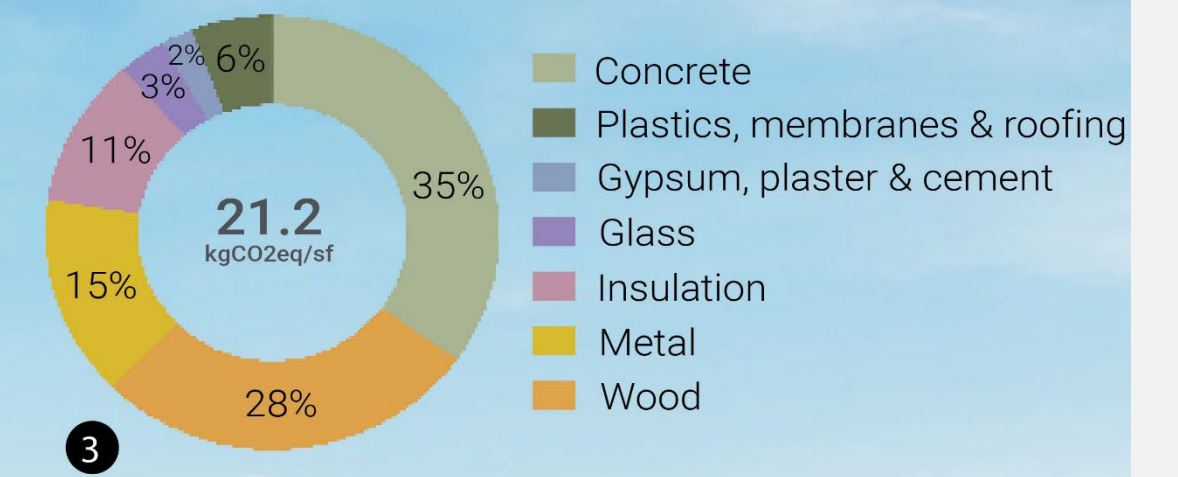


Case Studies

Portland Community College Opportunity Center

89% Energy Reduction
47% Carbon Reduction

Embodied Carbon Breakdown



The first floor is a Multnomah County Health Clinic, which Bora is also designing.

Location: 5600 NE 42nd Ave,
Portland, OR 97218
50,806 SF

1 Mass Timber FSC

FSC Certified mass timber structure sequesters carbon in the building while ensuring future forest health through sustainable harvesting



2 Structural Spacing

A consistent structural grid with optimized beam spans and column spacing allows the wood structural to be cost competitive with steel



3 Pin Wheel Layout

An innovative pinwheel grid layout that circles the central core allows for greater building depth while maintaining an optimal grid spacing



4 Exterior Cladding

The cladding material have the warmth of wood but require zero maintenance.



5 Windows to Wall Ratio

A 30% window wall ratio allows for quality daylight while maintaining a thermally resistant enclosure



6 Low Carbon Concrete Cores

The concrete core, necessary for seismic resilience are composed of a low-carbon concrete mixture. The use of slag reduces carbon emissions by 34%.



7 Hydronic Heating/Cooling System

The building is heated and cooled with hydronic radiant slabs, a more energy and resource efficient and comfortable strategy for space conditioning than the more common



8 LCA

This process allow us to better understand the carbon impacts of interiors finishes and choose lower carbon options.



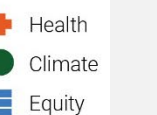
9 Solar Spaces

The project has roof top solar panels that offset 31% of energy use.

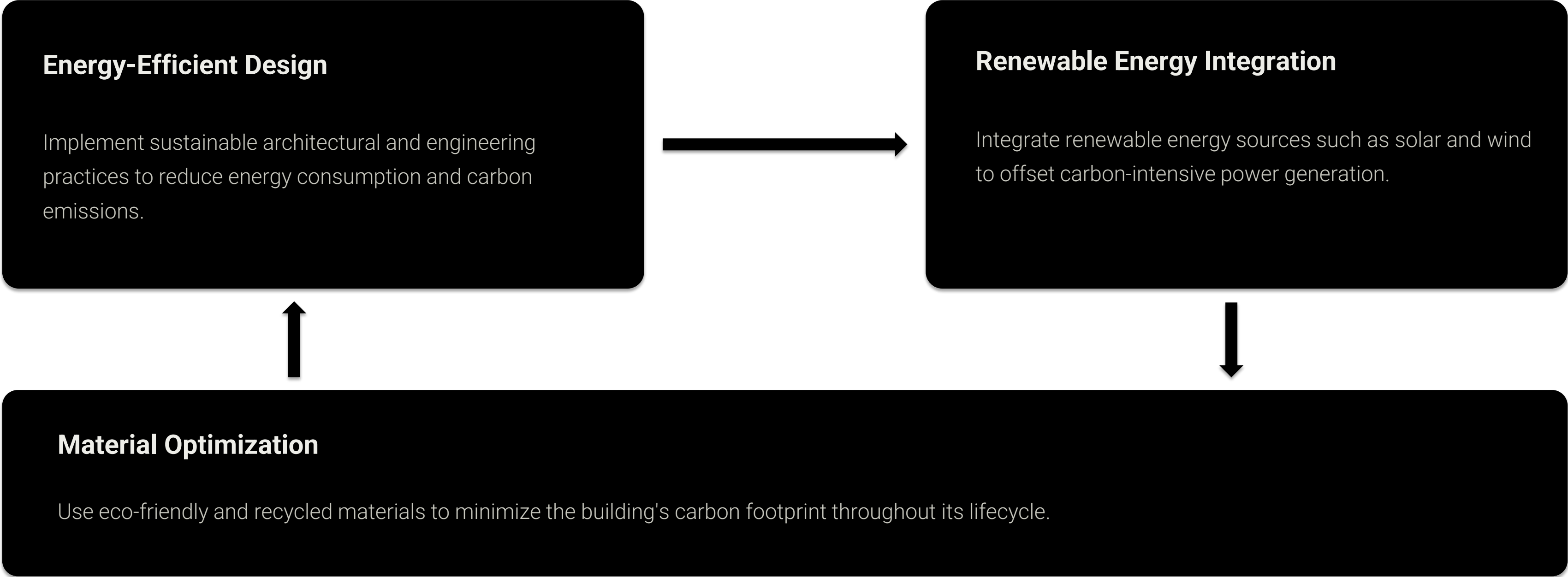


10 Community Solar

In additional the roof supports community solar panels that lower the utility bills of local community members.



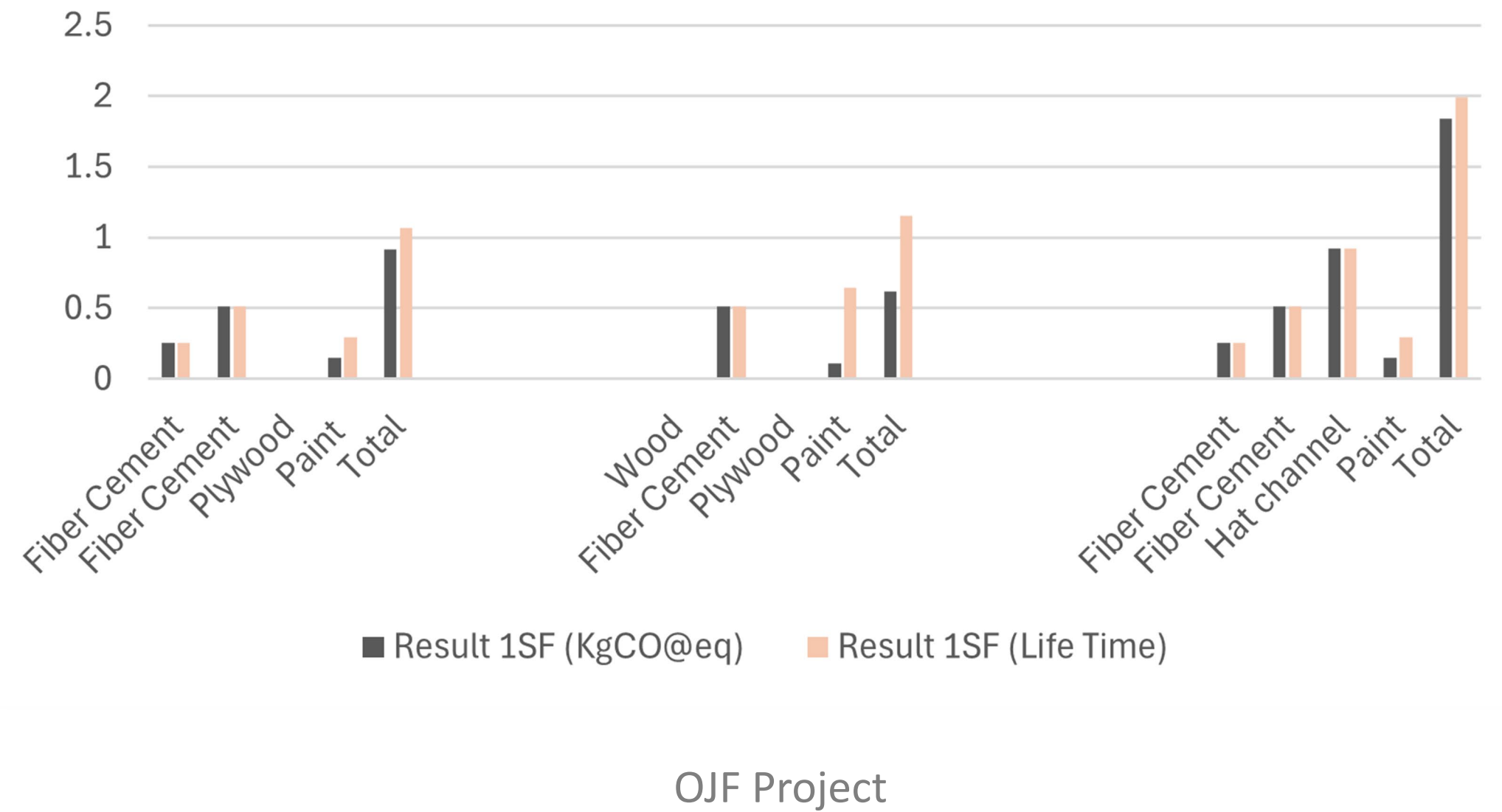
Reducing Carbon Footprint in Buildings



Take Aways

- Small Things Matter! (OJF Chart)
- Collaboration and Communication
- Importance of Starting Early

Comparative Carbon Emissions Analysis of Three Wall Material Configurations.



Thank You!

BORA

