# BORA

# Net Zero Emerging Leaders Internship 2024

Niusha Manavi

About Me

Born and Raised in Tehran-Iran

# BORA

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 <u>net zero</u> <u>energy</u> and <u>carbon</u>

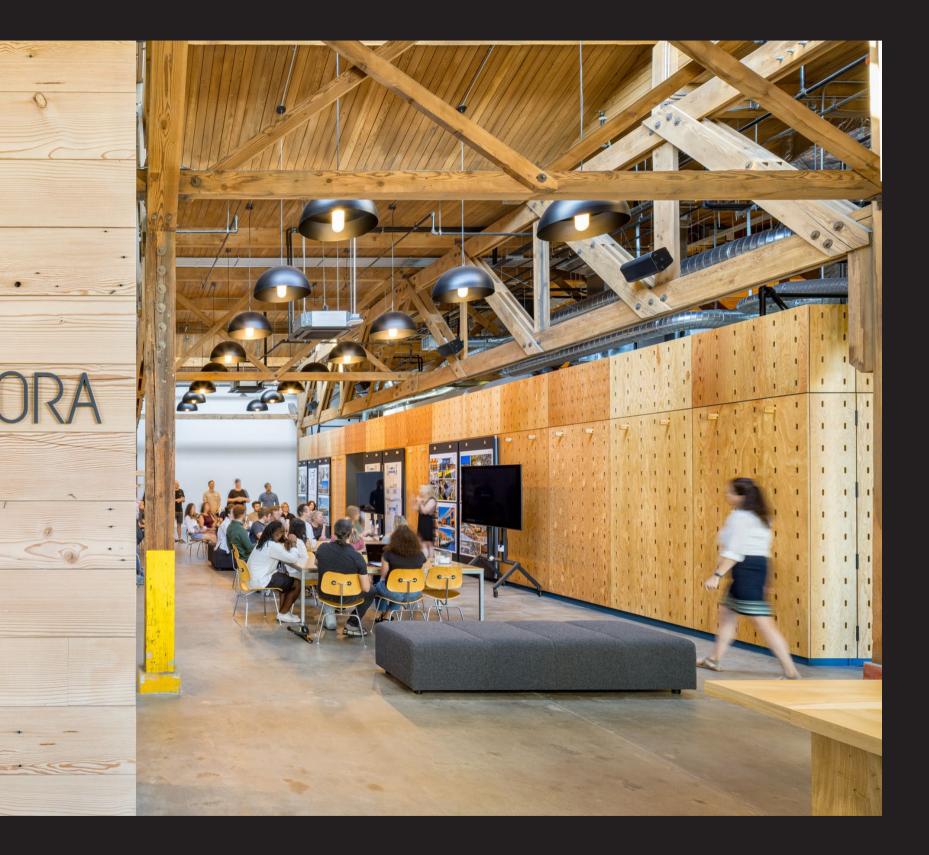
•Design that anticipates and mitigates <u>future risk</u>

•Measurably superior indoor air quality

•A building industry free of <u>specific known</u> <u>toxins</u>

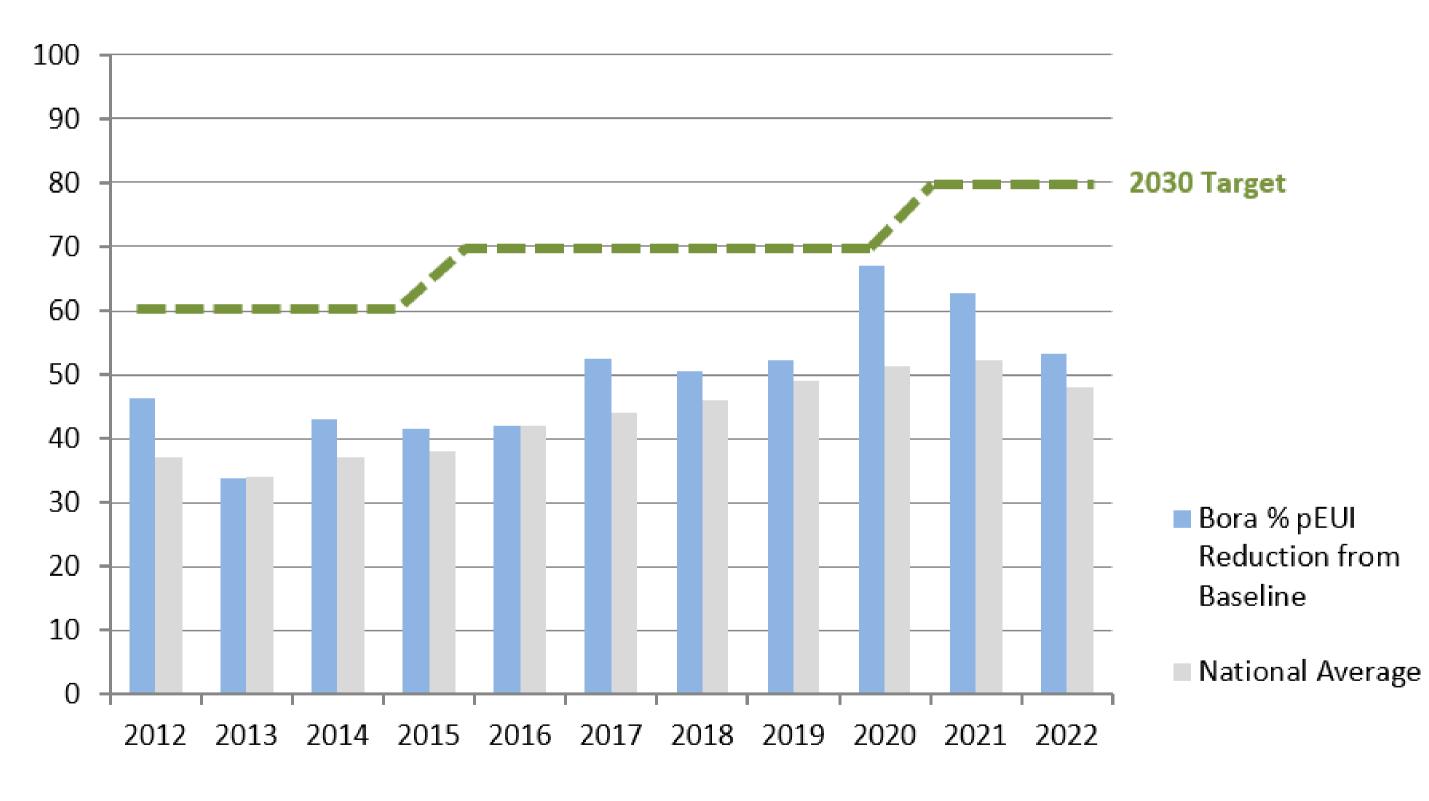
•An inclusive design process that promotes diversity and respects lived experiences

•An expanded approach to design that embraces community partnerships to ensure better outcomes



### 2030 Commitment

## **Bora 2030 Commitment Progress**

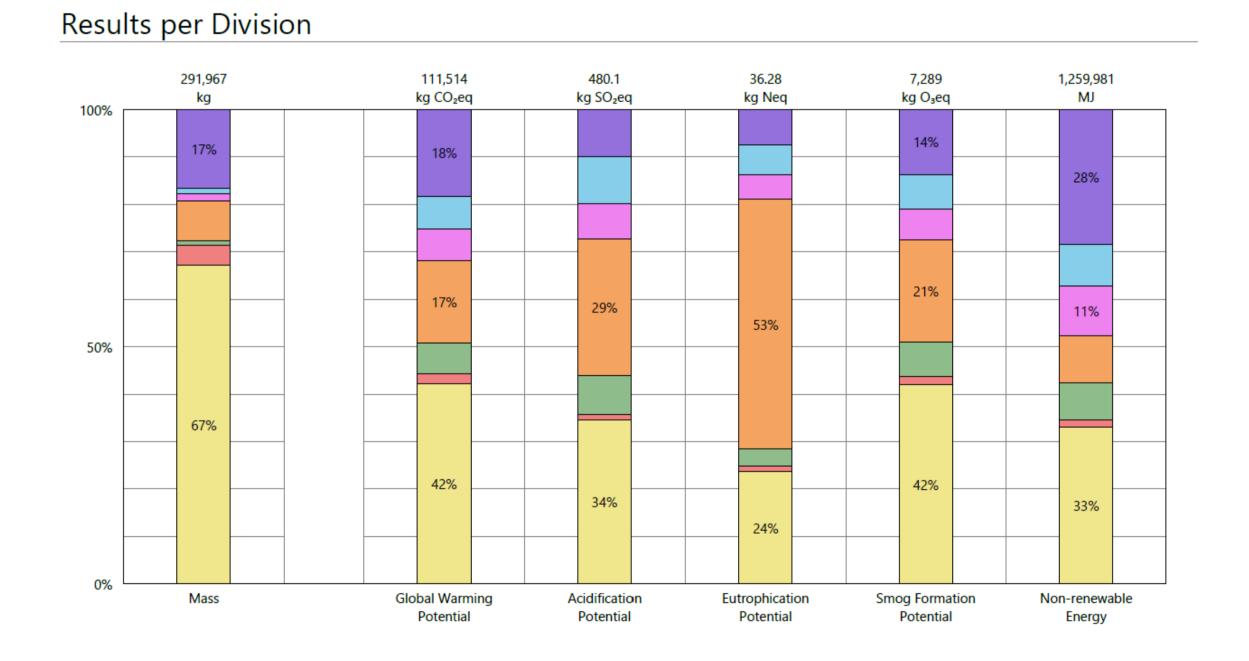


BORA

## 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





Process of using Tally for Measuring Carbon Footprint

### Data Collection 1.

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.

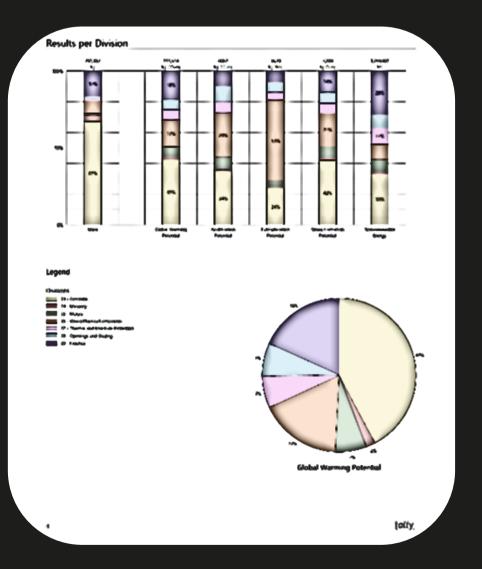
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Define Components and Quantity	Takeoffs				
Wall board, gypsum					
	compounds, topping compounds, and joint type (natural, fire resistant, moisture nish (if any).				
Board type					
Wall board, gypsum, natural	•	N			
Service Life					
Use default (30 years)	Existing or salvaged material				
Takeoff Method	Wall board thickness				
by Area 🔹 🔷	<b>5/8</b> °				
Þ 🛛 Finish	Paint, interior acrylic latex				
Foil facing	None				

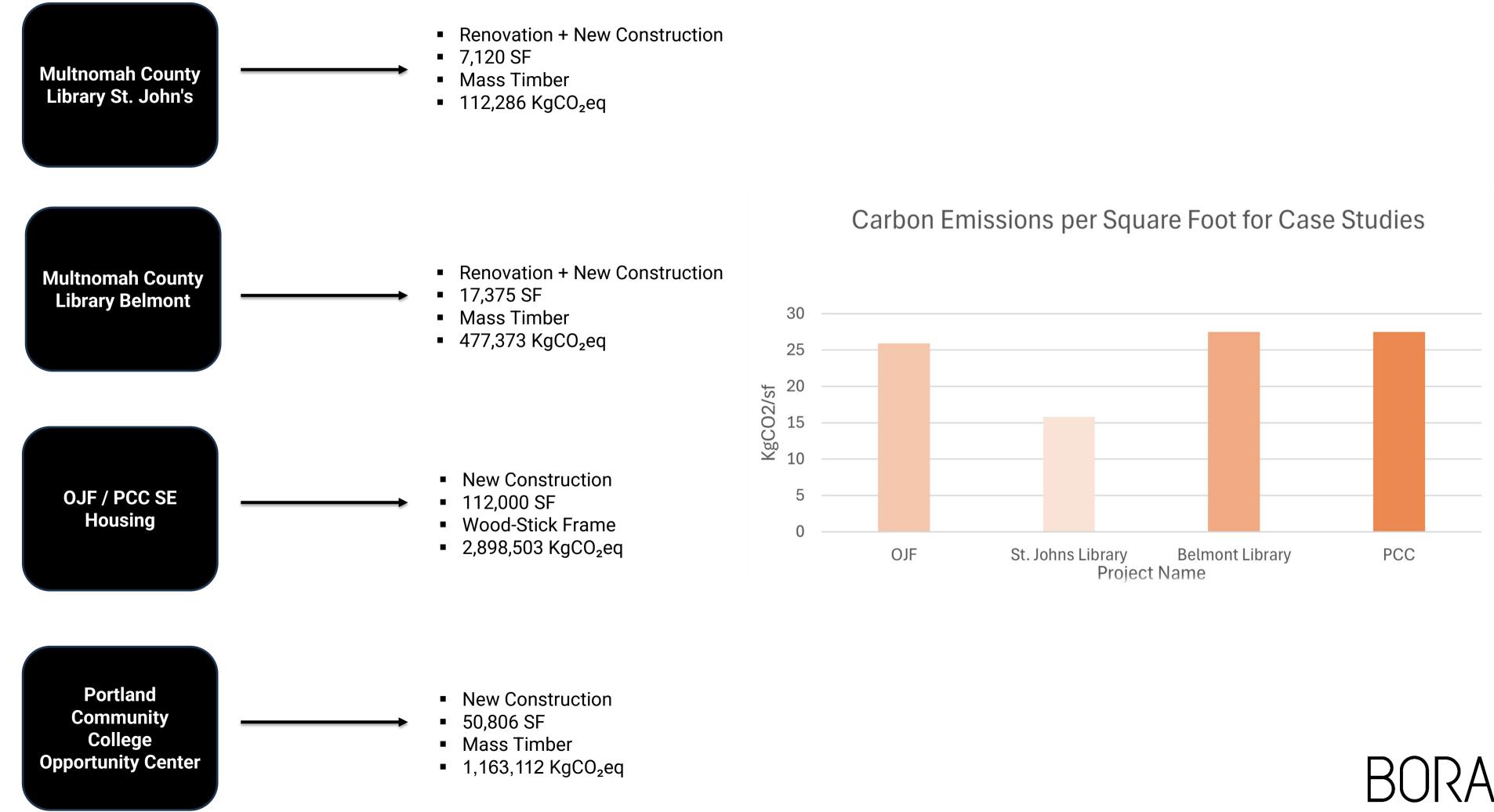
## 3. Analysis



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



### **Case Studies**



### Case Studies



### Mass Timber FSC

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





### Structural Spacing

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





### **Pin Wheel Layout**

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

### **Exterior Cladding** (4)

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

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

### Windows to Wall Ratio

5

7

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

### Low Carbon Concrete Cores 6

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



8 LCA

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

### 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



### 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.



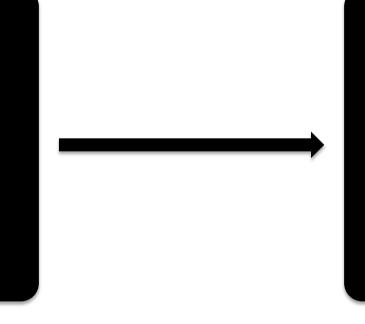




### Reducing Carbon Footprint in Buildings

### **Energy-Efficient Design**

Implement sustainable architectural and engineering practices to reduce energy consumption and carbon emissions.



**Material Optimization** Use eco-friendly and recycled materials to minimize the building's carbon footprint throughout its lifecycle.

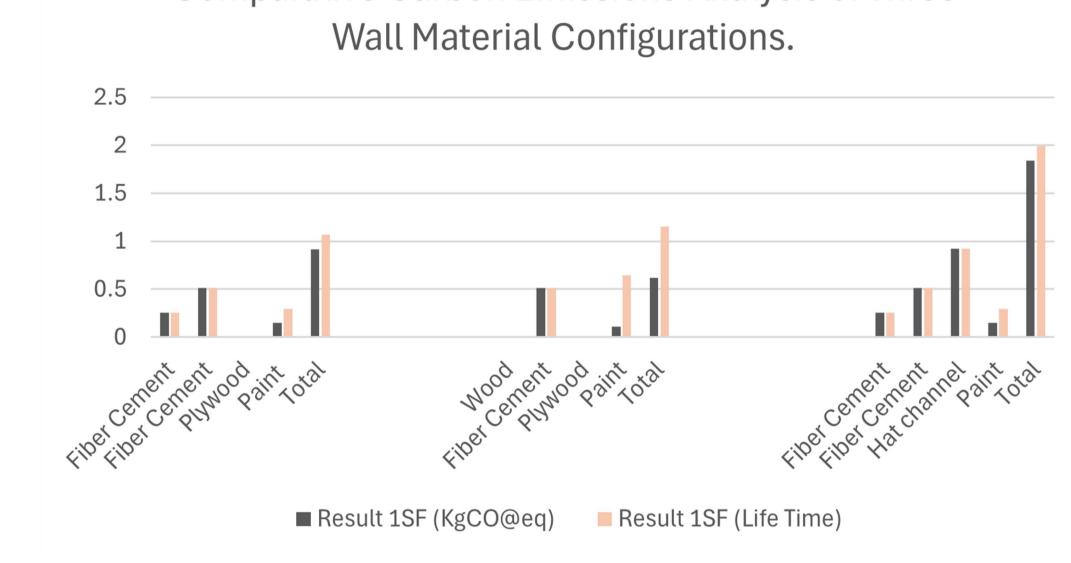
### **Renewable Energy Integration**

Integrate renewable energy sources such as solar and wind to offset carbon-intensive power generation.



### Take Aways

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



# Comparative Carbon Emissions Analysis of Three

**OJF** Project



# Thank You!



