



The purpose of this research is to assist team Salazar and Hacienda in researching embodied carbon in the construction materials that will be used in Las Adelitas affordable housing, public plaza and event hall project. As part of the AIA 2030 commitment, this report will help the team and their client prioritize collect necessary data to understand the climate impacts of selected materials, in order to reduce the building's carbon footprint, and improve the wellbeing of the environment and the Living Cully community.

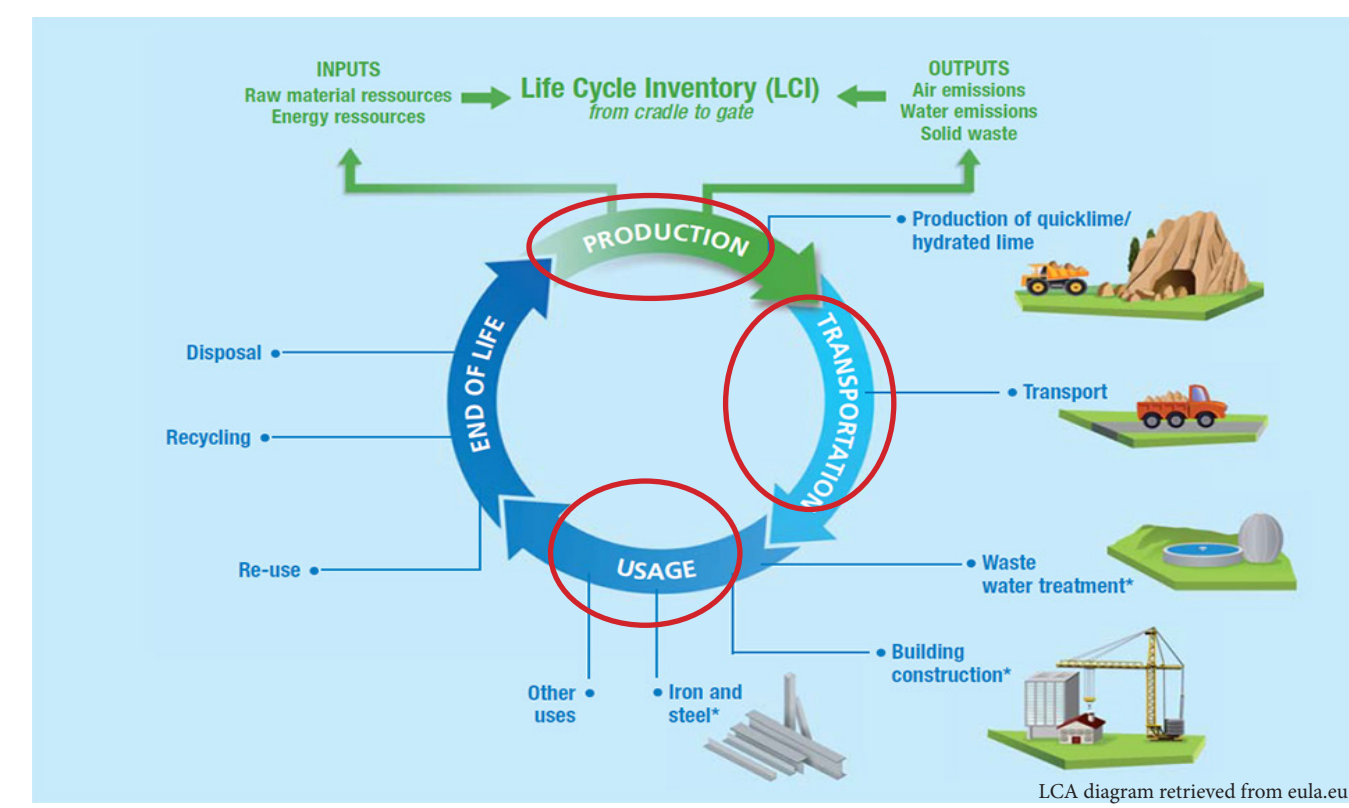
Matt Bokar - SR Associate, SR project manager
 Jake Lewis - Project manager
 Chelsea Clark - Design
 Emily Waldinger - Designer
 Nancy Barakat - Graduate student



The site plan includes outdoor seating and a performance stage, as well as space for temporary food carts and a future playground.

- OCTOBER**
- 8 Firm introduction
Project discussion
- 15 Collect information
and research LCA.
- 22 Research new tools to
analyze data, testing
Athena
- 30 Contact
manufacturers/
vendors to collect EPDs
- NOVEMBER**
- 06 Change of materials
due to lack of data in
limited time
- 12 Test materials in EC3
and collect information
- 19 Test more materials,
revise measurements
and compare results
- 24 Collection data review
and final revision
- DECEMBER**
- 03 Draft of presentation
- 10 Presentation

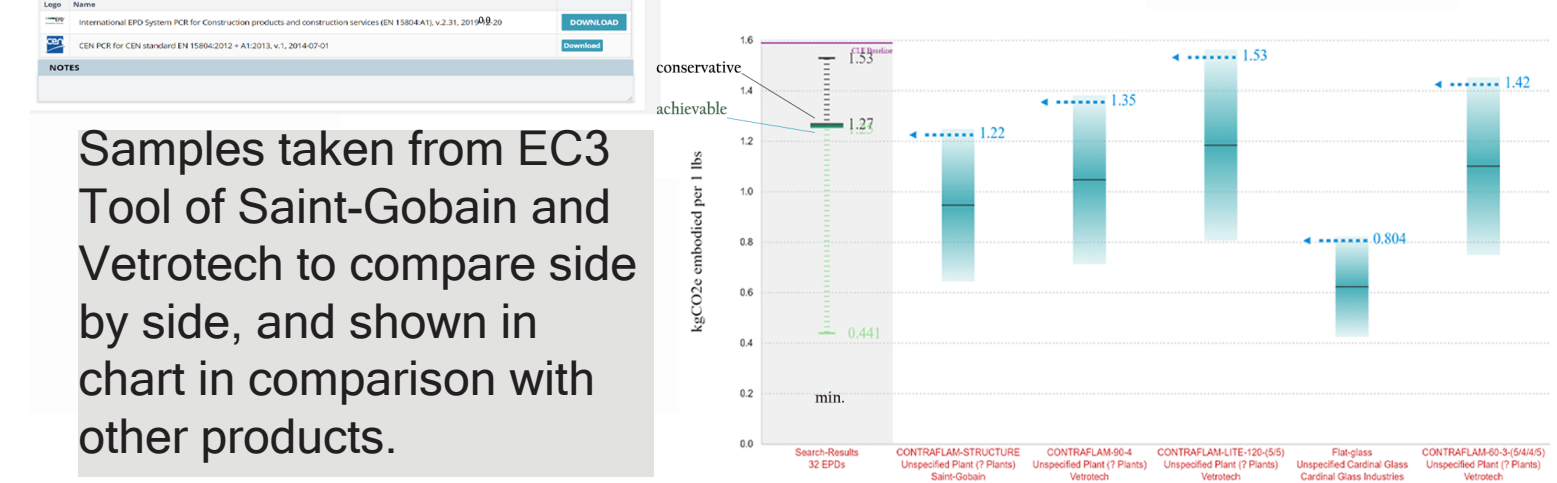
Calculating Embodied Carbon in LAS ADELITAS



This research is based on the assessment of products' life cycle from extraction to the factory gate.

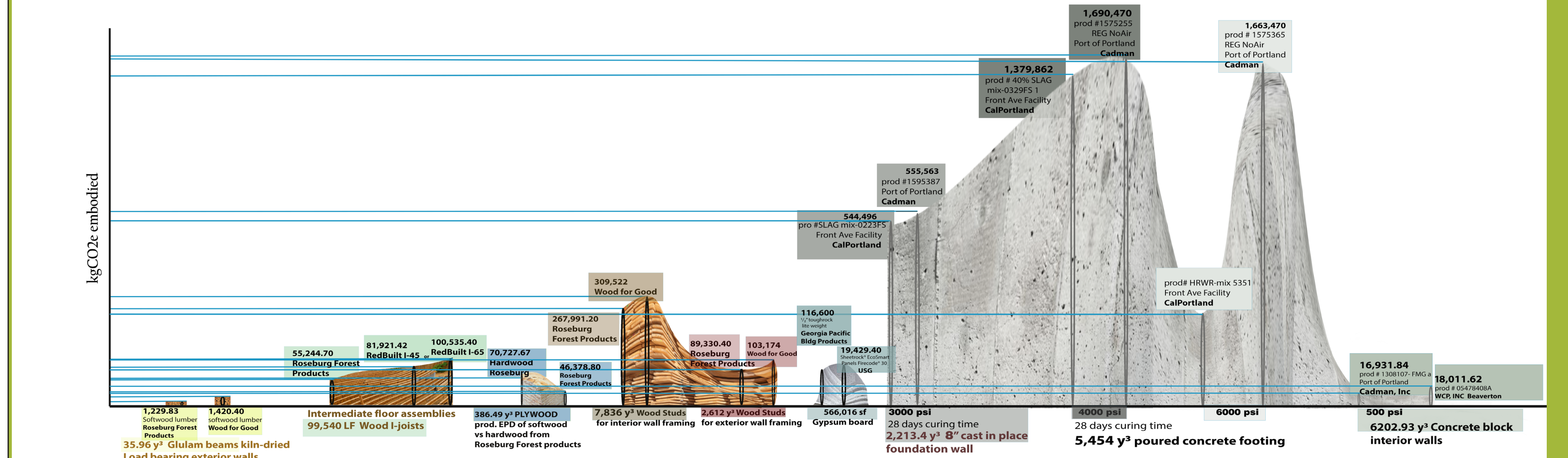
Embodied carbon in glass is presented in terms of pounds or kilograms

Organization Name: Vetrotech
 Product Name: CONTRALAM 90-6 (616/445/4)
 Description: CONTRALAM 90-6 is a low-emission glass with 100% recycled content...
 Embodied Environmental Impact: 183 kgCO2e / 1 yd3
 Product Specifications: Product Description, Dimensions, Weight, etc.



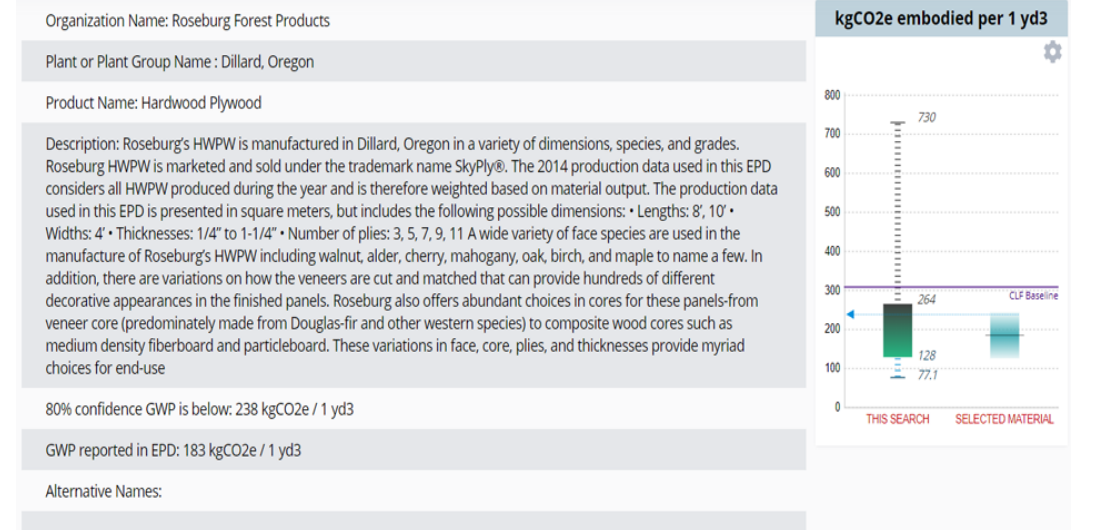
Samples taken from EC3 Tool of Saint-Gobain and Vetrotech to compare side by side, and shown in chart in comparison with other products.

Cradle to Gate Calculations Results

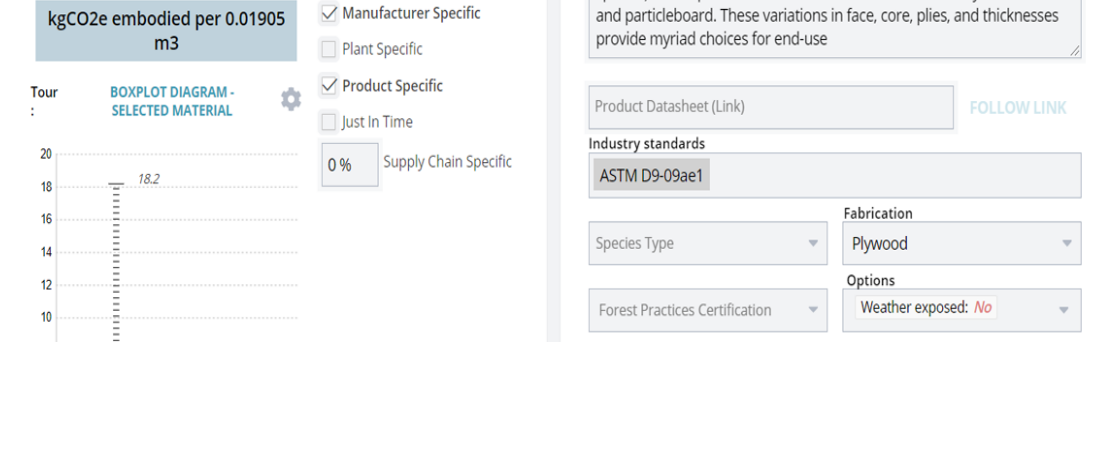


Calculations of GWP embodied carbon (global warming potential) in selected materials, using samples from valid environmental product declarations (EPD) and EC3 tool. This chart uses comparative results of two different manufacturers per material. However, it does not include steel studs, window glass panes, as embodied carbon in these materials is measured in units of weight and mass, pounds or kilograms for glass, pounds or tons for steel) and the project is still in early stages and lacks specific measurements for solid products.

No comparison test could be done on hardwood plywood; search results only showed one product EPD from a local manufacturer and one North American industry EPD. Product-specific EPD can not be compared with generic, or industry-wide EPDs as one that is released by multiple manufacturers, often through a trade association, to publish the average footprint of the entire industry.

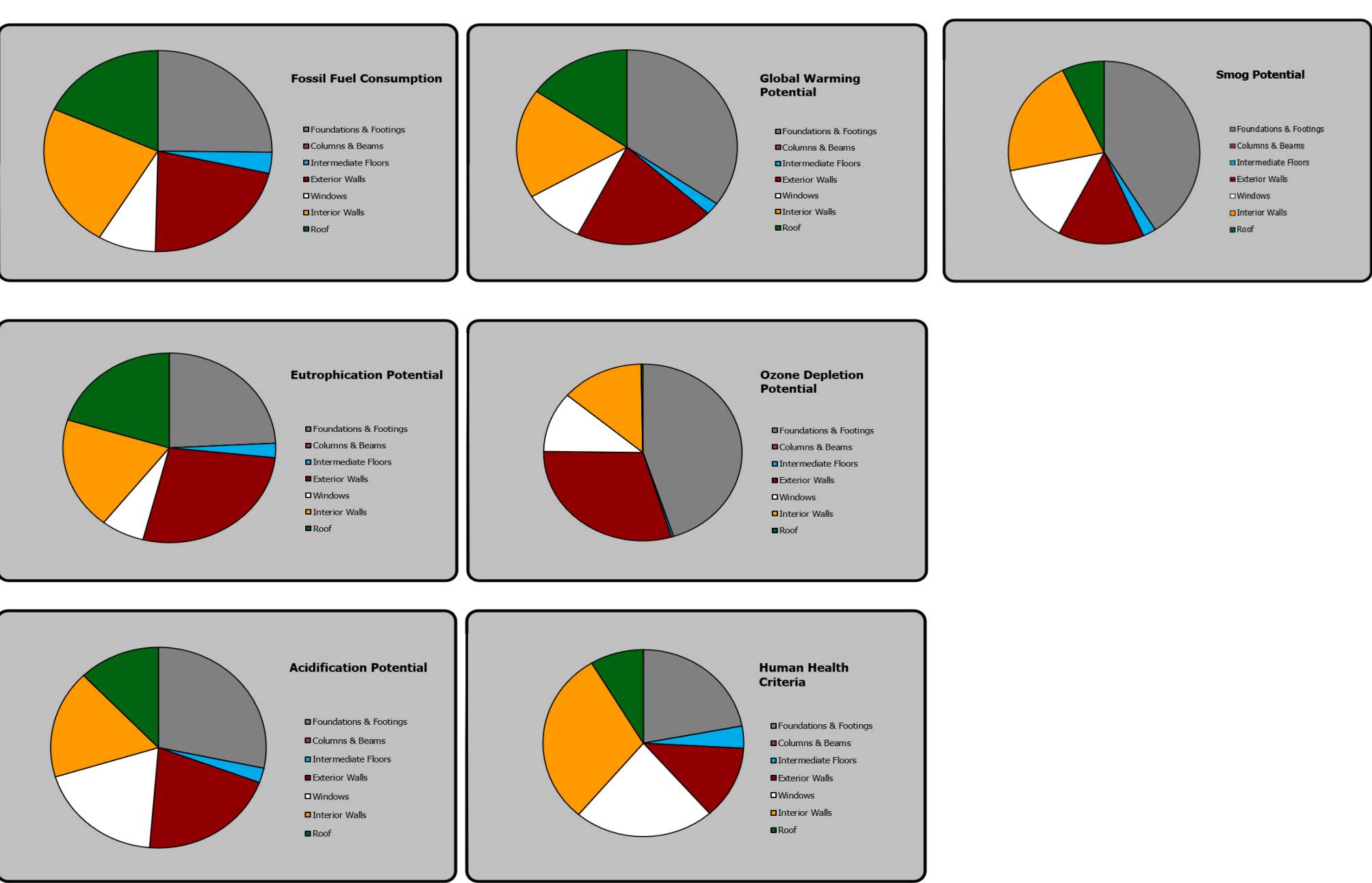


Organization Name: Roseburg Forest Products
 Plant or Plant Group Name: Dillard, Oregon
 Product Name: Hardwood Plywood
 Description: Roseburg's HWPW is manufactured in Dillard, Oregon in a variety of dimensions, species, and grades...
 Embodied Environmental Impact: 228 kgCO2e / 1 yd3
 Product Specifications for "HARDWOOD PLYWOOD": Product Description, Dimensions, etc.



Athena EcoCalculator for Residential Assemblies
 Version 1.21
 Location: Seattle
 ASHRAE climate zone 4

ASSEMBLY	Total area	Fossil Fuel Consumption (kg CO2e)	Global Warming Potential (kg CO2e)	Acidification Potential (kg SO2e)	Human Health Criteria (kg PM10e)	Ozone Depletion Potential (kg CFC11e)	Smog Potential (kg O3e)
Foundations & Footings	151,268	13,599,460	1,391	336,212	5,551	387,287	11,370
Columns & Beams	226	226	0	0	0	0	0
Intermediate Floors	86,544	1,830,747	81	27,997	958	39,215	900
Exterior Walls	87,400	11,769,556	816	245,479	3,188	436,965	7,546
Windows	10,121	4,445,367	387	235,530	5,696	105,224	2,780
Interior Walls	352,100	12,567,147	727	207,760	7,602	306,997	3,410
Roof	44,272	9,802,201	609	145,223	2,168	323,580	7,721
TOTALS		54,014,883	3,990	1,168,206	25,163	1,596,274	25,276



Athena is an LCA spreadsheet software that allows industry professionals to compare environmental considerations of construction materials at the conceptual and pre-construction stages of a project. This LCA calculator can be used as a support estimator tool to better understand the trade-offs between the addition or reduction of certain parts of the building assembly.

