

ACUSTI CAT

V Congrés
d'Acústica de
Catalunya

Manresa

24 i 25 | ABRIL | 2024

Investigacions pioneres en l'àmbit de l'enginyeria acústica amb potencial de transferència a la societat

*Utilizing sustainable materials in Building Acoustics and Room Acoustics:
Insights from Brazil*

Rodrigo Scoczynski Ribeiro, Civil Engineer, PhD

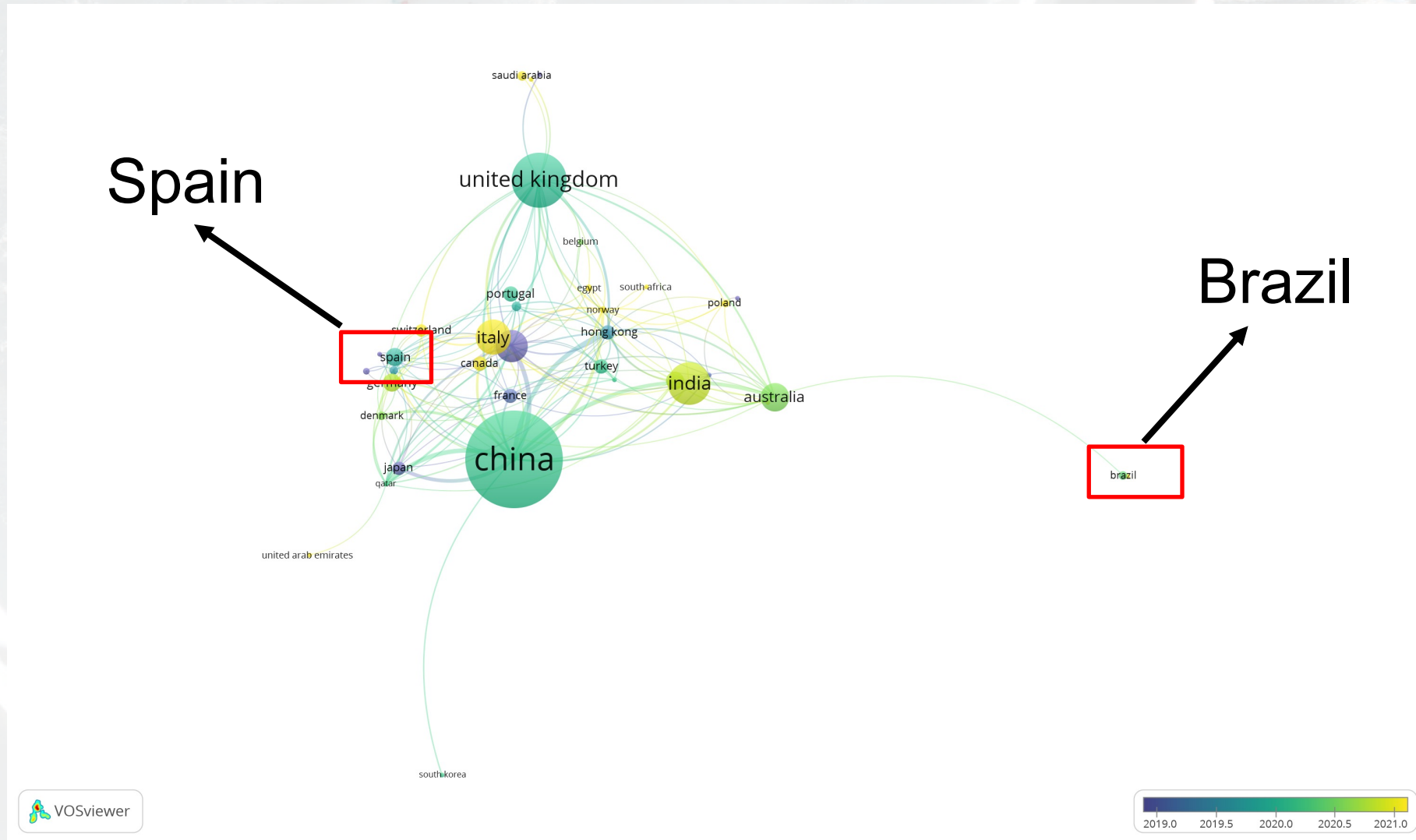
WWW.CONGRESACUSTI.CAT

Carbon footprint of the construction sector

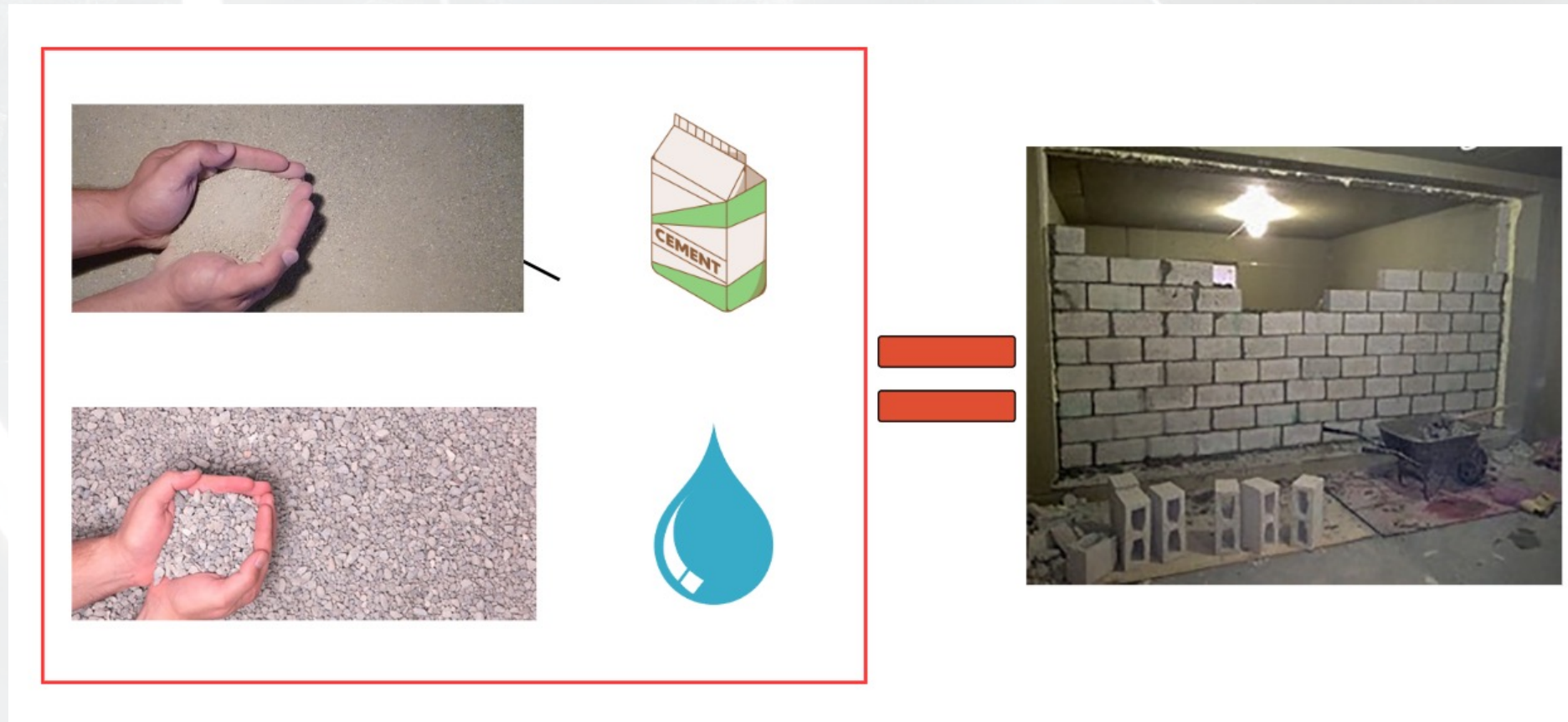
- A carbon footprint is the total amount of greenhouse gases, specifically carbon dioxide, released into the atmosphere as a result of human activities, such as driving a car, using electricity, or manufacturing goods;
- 40% of the world's total Carbon Dioxide emissions in 2018 came from the construction sector!
- If the volume of all these gases continues to rise in the environment, the earth's surface temperature also rises quickly above the previous levels.

Carbon footprint of the construction sector

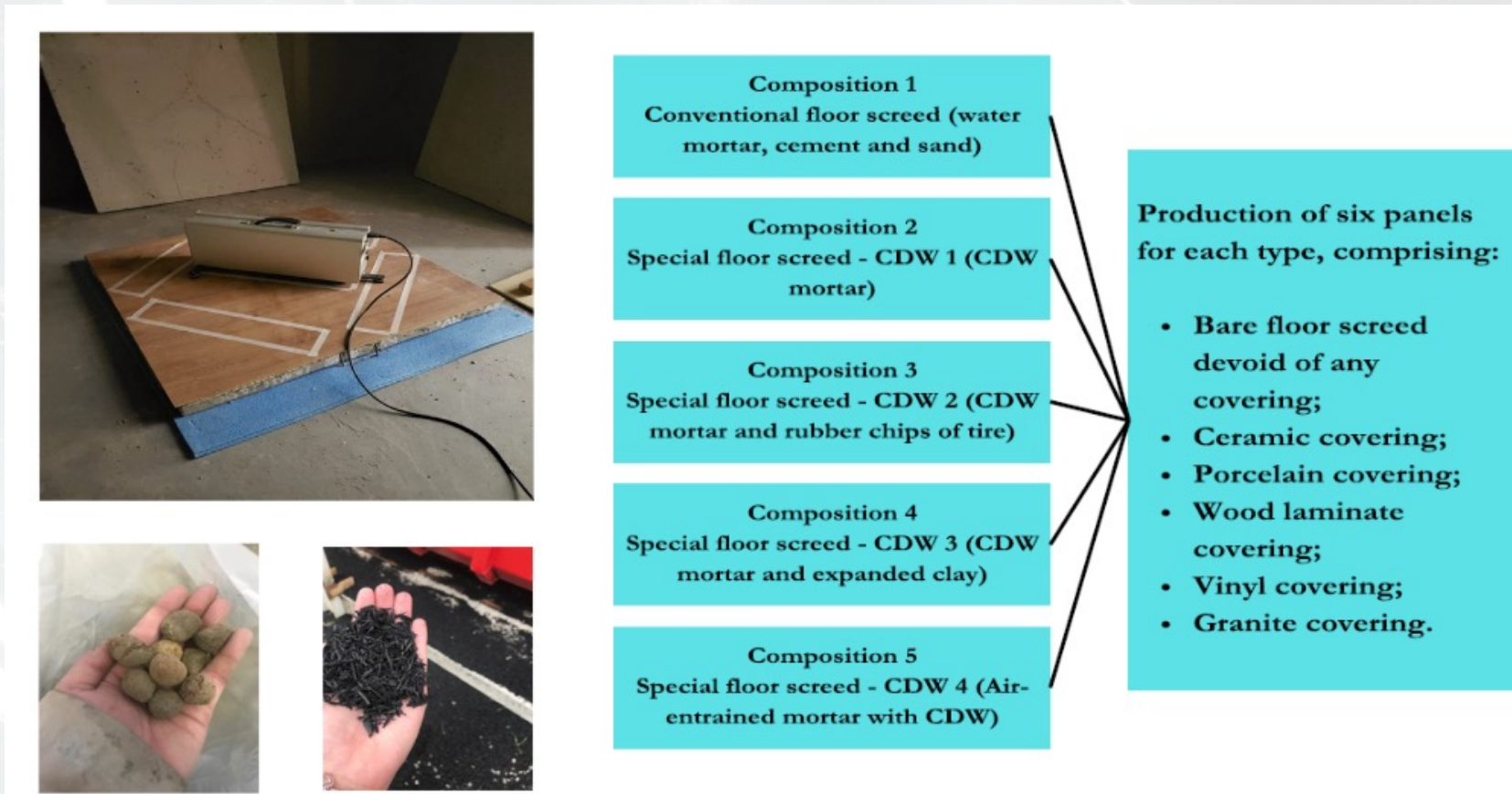
A SCOPUS research using the keywords: "carbon" AND "emission" AND "construction sector" revealed 763 documents; Using the VOS Viewer software to create a visual map of these studies we have this (considering the number of times they cite each other by countries):



The use of Construction and Demolition Waste



The use of Construction and Demolition Waste

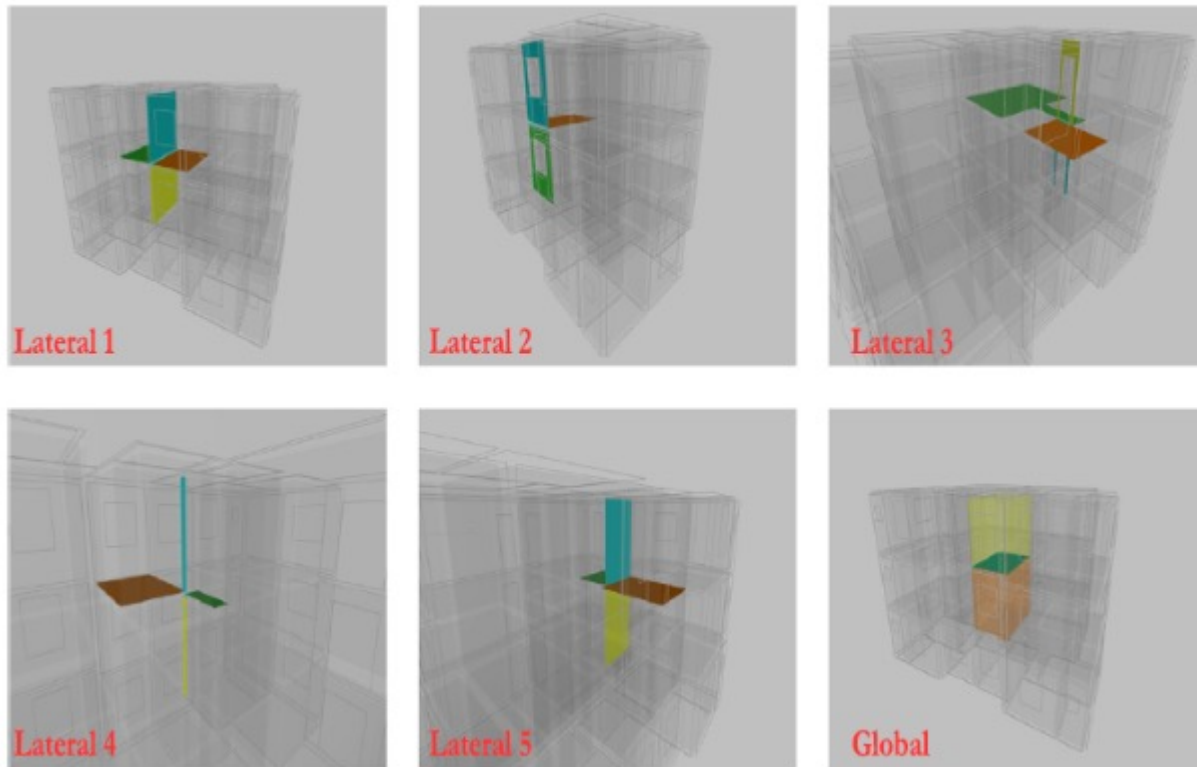


The use of Construction and Demolition Waste

Coating	Mass per unit area (kg/m ²)				
	Conventional	CDW 1	CDW 2	CDW 3	CDW 4
Uncoated floor	102.68	86.11	74.52	69.35	82.80
Ceramic floor	117.24	98.45	85.30	79.42	94.69
Porcelain floor	123.85	104.10	90.28	84.11	100.15
Laminate floor	118.71	99.60	86.23	80.25	95.78
Vinyl flooring	112.88	94.72	82.02	76.34	91.09
Granite floor	124.19	104.44	90.62	84.45	100.49

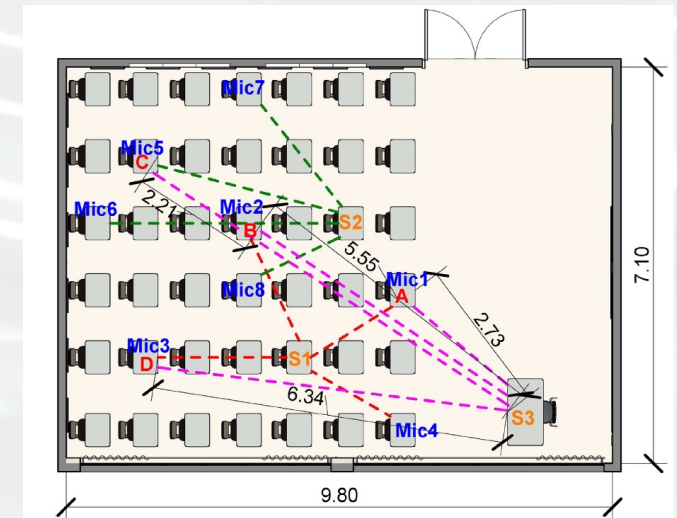
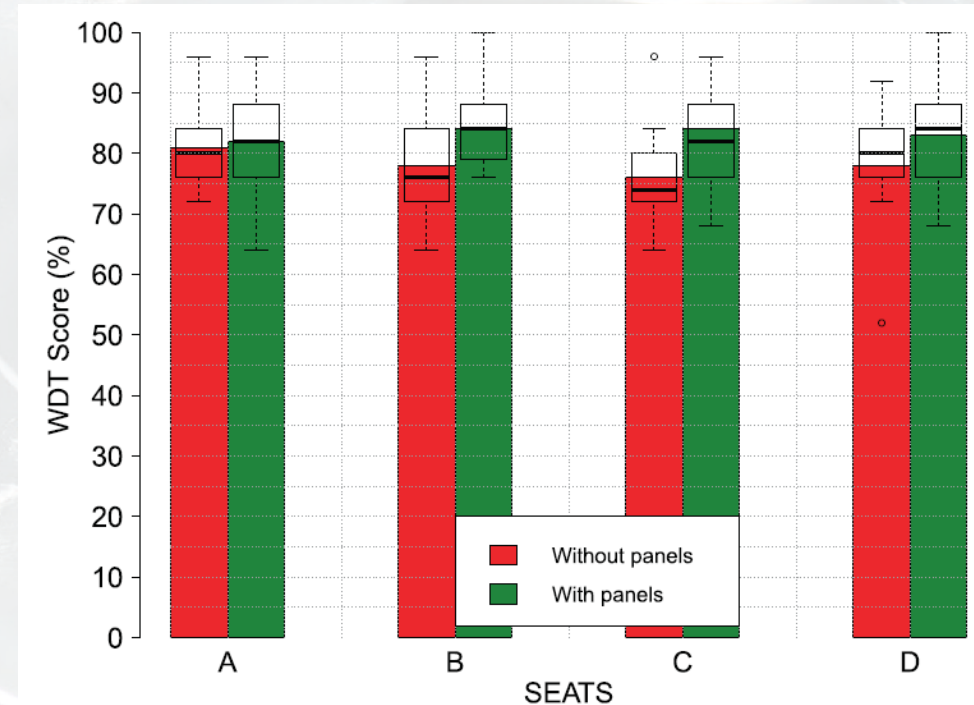
Coatings	L _{n,w} dB of the flooring systems				
	Conventional	CDW 1	CDW 2	CDW 3	CDW 4
Uncoated Subfloor	55	54	54	53	55
Ceramic Floor	53	52	50	52	53
Porcelain Floor	51	54	53	52	54
Laminate Flooring	47	45	50	44	51
Vinyl Floor	52	52	51	49	53
Granite Floor	48	48	47	45	51

The use of Construction and Demolition Waste

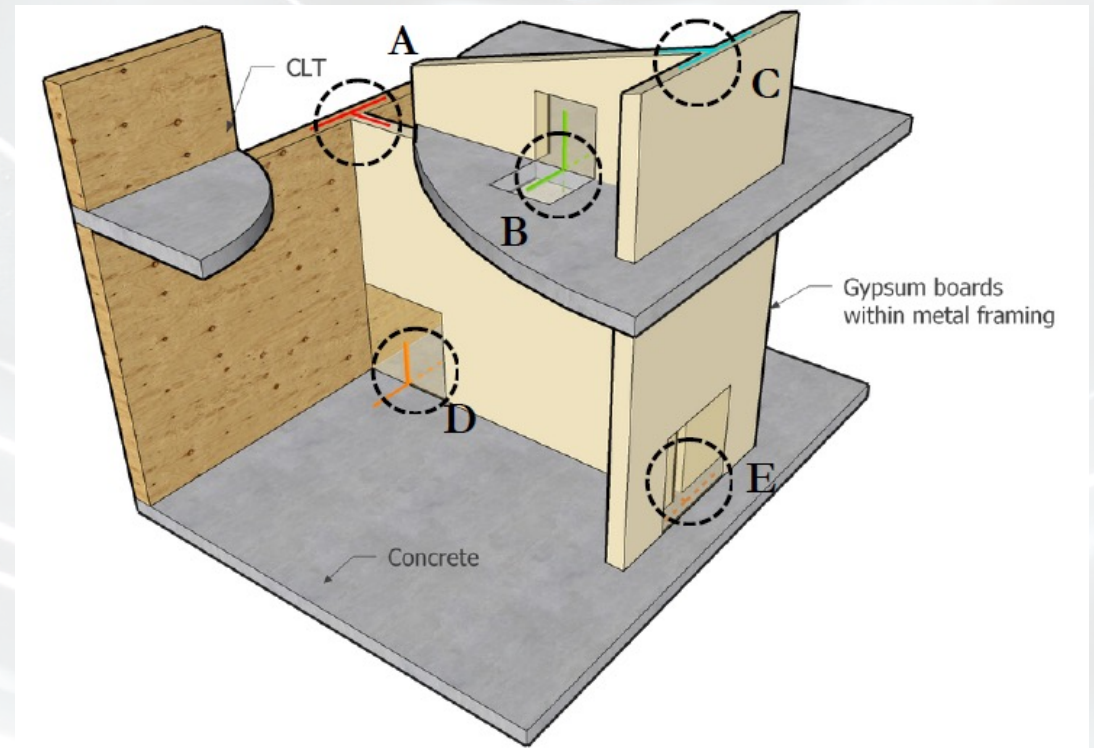


Coating	$L'_{nT,w}$ dB — Floor screed type				
	Conventional	CDW 1	CDW 2	CDW 3	CDW 4
Ceramic floor	54	53	49	54	53
Porcelain floor	54	57	56	53	54
Laminate floor	51	52	51	47	55
Vinyl flooring	54	53	53	51	54
Granite floor	48	49	48	46	53

Room acoustics



Brazilian Engineered Wood Products (EWP)



Conclusion

- Before concluding that a material is sustainable, it is essential to comprehend all the embodied energy involved in its production, including transportation.
- A holistic approach to these materials must be taken into account when integrating them into environments, considering factors such as fire retardancy, durability, industrialization potential, and more.
- Additionally, it is feasible to quantify the relationship between 1 kgCO₂eq and 1 dB of sound insulation.

ACUSTICAT

V Congrés
d'Acústica de
Catalunya

Manresa

24 i 25 | ABRIL | 2024

Investigacions pioneres en l'àmbit de l'enginyeria acústica amb potencial de transferència a la societat

*Utilizing sustainable materials in Building Acoustics and Room Acoustics:
Insights from Brazil*

Rodrigo Scoczynski Ribeiro, Civil Engineer, PhD

WWW.CONGRESACUSTI.CAT