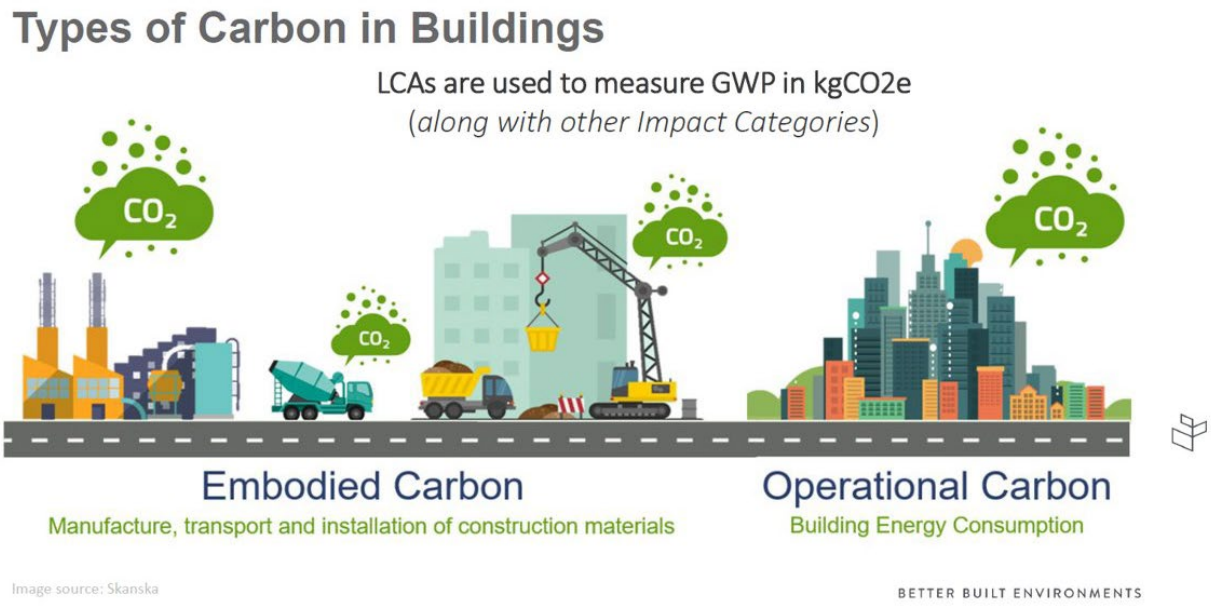
Global IFS & Sustainability

Global IFS is a sustainable corporation focused on being environmentally responsible. We source raw materials through ethical suppliers, we use processes that are neutral to our environment and dispose of waste through recycling or waste to energy streams to make us a zero-landfill facility. The TecCrete product contains the highest amount of recycled content in the access floor industry. Global IFS continues to make changes to our product and processes to minimize our Carbon Emissions.

We believe using access floor in combination with modular power and underfloor air allows our customers to create buildings that are high performance spaces. Using access floor facilitates more flexible spaces and cleaner air.

In this article you will find discussion of our Life Cycle Analysis and the improvements the Global IFS products can provide for a newly constructed building. We will begin by looking at the Carbon Footprint of a building. There are two types of Carbon which buildings contribute, Embodied Carbon and Operational Carbon.



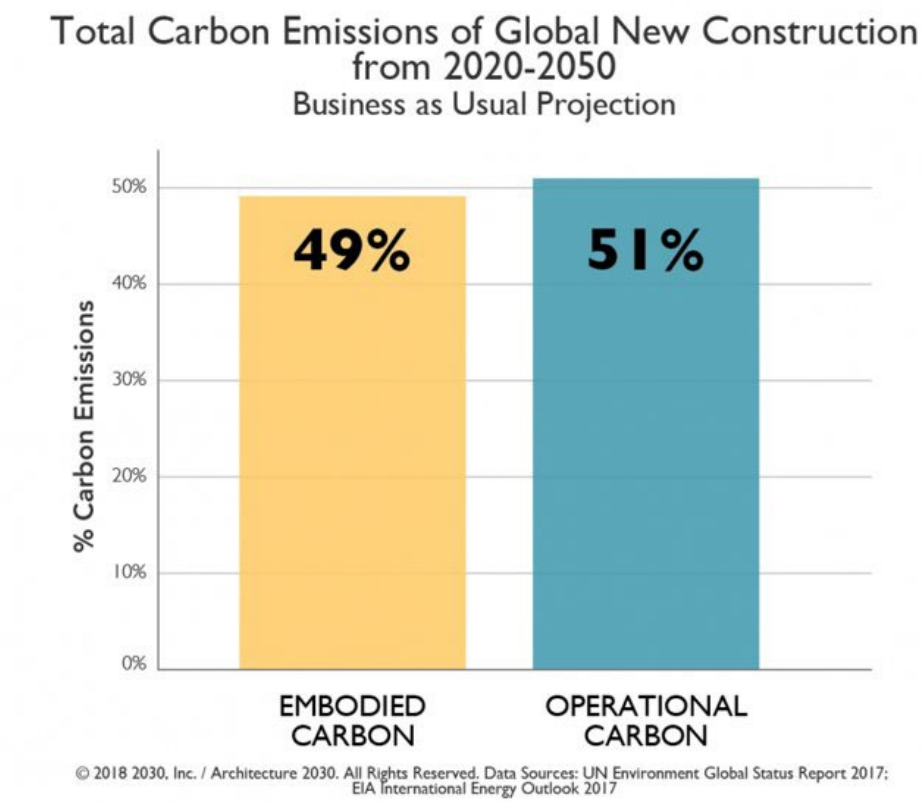
Embodied Carbon

Embodied carbon is the amount of carbon (or greenhouse gas) emitted during the construction of a building. Carbon emissions result from the extraction of raw materials, the manufacturing and refinement of materials, transportation to production or jobsite, installation of the product and disposal of any waste. This is the part of the carbon footprint of a building before it becomes operational.

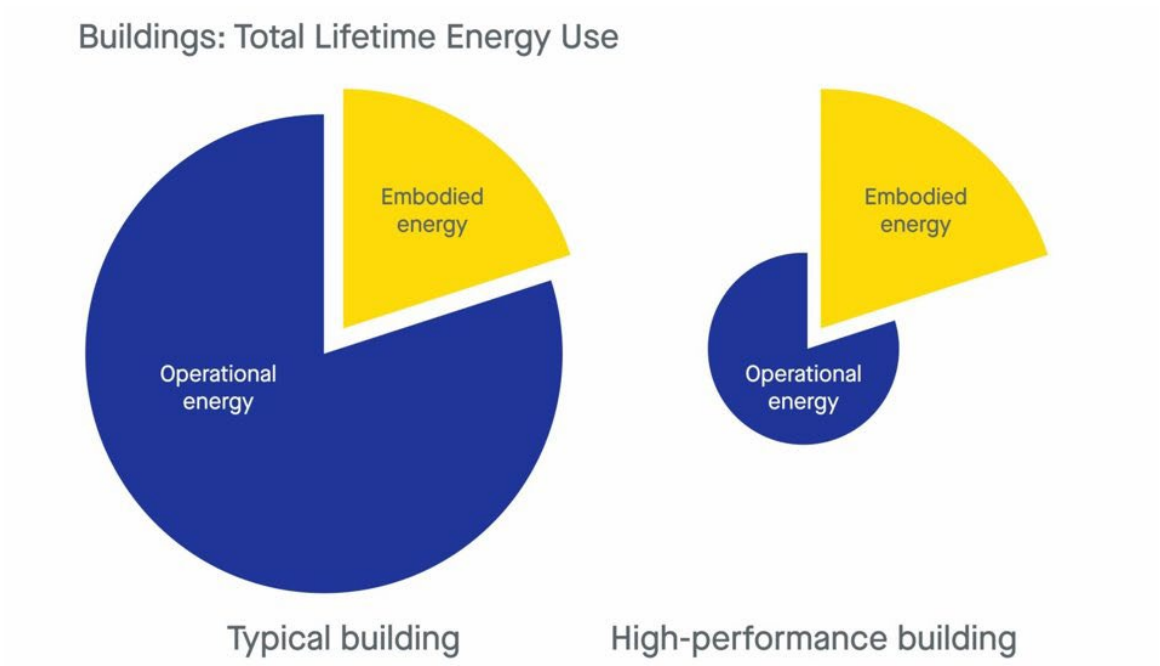
Operational Carbon

Operational carbon refers to the greenhouse gas emissions due to building energy consumption. The total from all energy sources used to keep our buildings warm, cool, ventilated, lighted and powered.

Studies have shown that both embodied carbon and operational carbon impact the overall carbon footprint of a building.

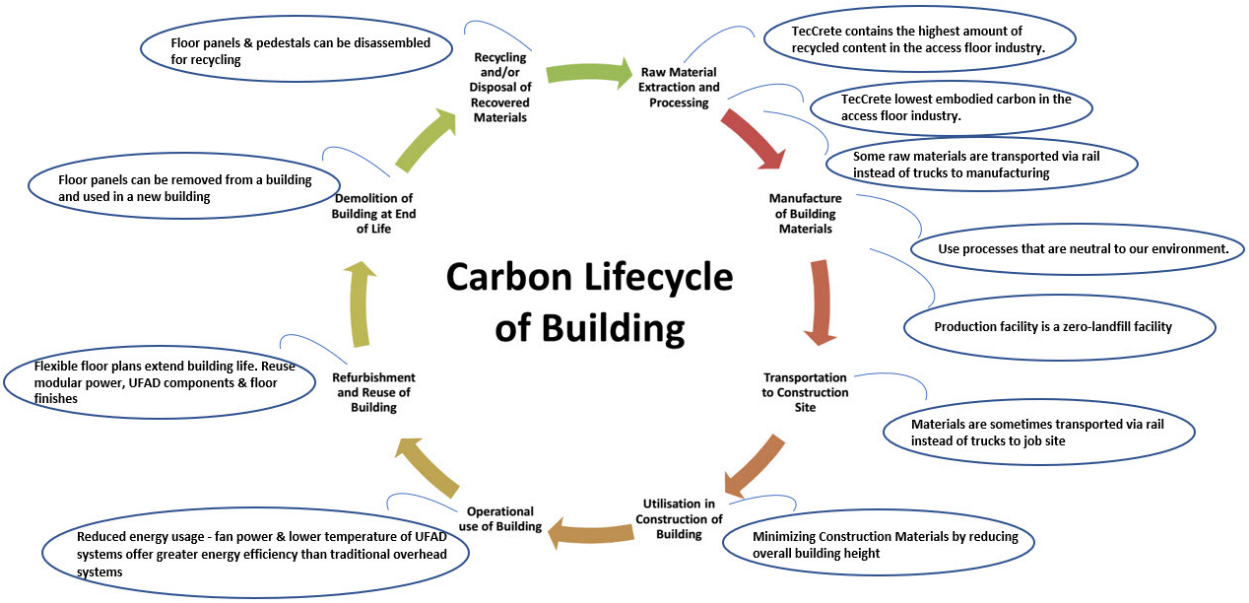


Over the lifetime of a building, it has been shown that high-performance buildings designed with underfloor air and raised access floor contribute much less to the embodied energy use.



Global IFS & Embodied Carbon

In reviewing the carbon lifecycle of a building we can see the following impact of raised access floor throughout the building life.



Third Party Life Cycle Analysis of TecCrete:

Global IFS has the lowest embodied carbon of all raised access floor manufacturers in the industry. The product design with a steel pan and cementitious emits less greenhouse gas emissions (GHGs)

15.0 INTERPRETATION

The primary goals of the comprehensive LCA for the TecCrete flooring system were developed at the beginning of the project with GIFS and are outlined in the Introduction of this report. The Interpretation section serves as a discussion of the results and their relationship to the initial goals of the study.

The cradle-to-grave LCA showed several intriguing results for interpretation as part of the study. While these are discussed in the Life Cycle Impact Assessment and Sensitivity sections of the report, they are further summarized here.

- The results of the cradle-to-grave LCA for TecCrete 1250 panel system has a global warming impact of 74.6 kgCO2eq. for the TecCrete Flooring system per 1 m^2. Similarly, TecCrete 1500 has a global warming potential of 79.6 kgCO2eq., TecCrete 1500SL has 85.7 KgCO2eq., TecCrete 2000 has 91.7 KgCO2eq. and TecCrete 2500 has 95.2 KgCO2eq. per 1m^2.
- The results show that the Raw material stage contributes the most towards all the stages of product life cycle except for Ozone depletion where the downstream transportation to installation (A4) in the life cycle contributes the most to the environmental impacts for all TecCrete system.
- Consideration should be taken to reduce energy consumption at the production stage, which can be achieved through efficiency and/or the use of renewable energy (on-site production or through the purchase of renewable energy credits).
- Downstream Transportation contributes majorly towards all the environmental impacts as the downstream is mostly via truck, considering a substantial portion of this via rail could reduce the environmental impacts which is shown in Sensitivity scenario 6.

Source: TecCrete Raised Access Floor Life Cycle Assessment prepared by Intertek Health Services Inc.

What does this mean? Competitors who offer a steel panel with cementitious fill have a higher global warming contribution compared to TecCrete. TecCrete contributes 7.4 kgCO2 less than our competitors per square meter of space. Over a large building this could add up.

Life Cycle Analysis of Global IFS Underfloor Air and Modular Power:

Historically, LEED has not required GHGs data for HVAC and Power components. Thus, Global IFS does not currently have specific GHGs data on these components. We are working with our suppliers to develop the data for these components.

However, we do know the operational cost savings of using these systems is dramatic!

Global IFS & Operational Carbon

There is significant cost savings in implementing underfloor air system as compared to an overhead heating and cooling system.

Comparison	Overhead Design	Underfloor Design
Reduced Sheet Metal Ductwork	Lots of ductwork	Minimal to no ductwork
Reduced Ceiling Clutter	Historical standard	All building infrastructure is underfloor
Possible Floor Height Reduction	Historical standard	Reduces the overall building height saving building materials
Lower Peak System Horse Power	Higher system static pressure	Lower power requirements
Higher Building Temperature	More energy usage	Less cooling energy used
Improved IAQ	Mixing air with overhead heating results in more energy waste	Improved Ventilation Effectiveness results in less energy use
Future Proof Your Building	Reconfiguration results in more waste.	Reuse of Building Infrastructure reduces waste and extends the life of the building.

Case Study Comparison of two buildings

one with overhead air handling and one with underfloor air handling

DSI built two buildings in Austin, TX. One utilized traditional overhead heating and cooling while the other utilized underfloor air and air towers. The Underfloor Air building achieved an Energy Star rating of 95. They found significant energy usage reduction in the underfloor air building as compared to the overhead air building.

	ELECTRIC USAGE	
	Overhead	**Underfloor Air**
	One West Hills VAV Building	Buda UFAD Building
ENERGY STAR RATING	71	95 (Estimated)

- An Energy Star Rating of 50 is considered median. A Rating of 75 indicates that the business is a top performer in energy efficiency, and may be eligible for an Energy Star certification.
- On average, ENERGY STAR certified buildings use 35% less energy than typical buildings nationwide, and command a premium of up to 16% for sales prices and rental rates.

Blue Ocean Energy couldn't believe the energy consumption and was concerned that they were monitoring the wrong meter. They indicated that the Buda building was "at the extreme low end of energy consumption for all of their customers city-wide."

"As the Mechanical Engineer of Record for the project, I was a little nervous about all of the new technology that we had planned for this building. Now that the project is complete, I'm very pleased with the overall performance of the system and the energy performance so far has been amazing. The building is one of the quietest I've ever experienced with virtually no perceptible HVAC noise at all." —Kurt Zinsmeyer

Operational Energy Savings

DSI partnered with an energy consulting firm, Blue Ocean Energy, to track the building energy consumption and provide Energy Star Ratings. The energy usage for the first 8 months exceeded everyone's expectations!

Month	Electric Usage			
	Overhead		Underfloor Air	
	One West Hills VAV Bldg		Buda UFAD Building	
	(KWH)	(KWH/sft)	(KWH)	(KWH/sft)
April	76,800	1.40	Building Under Construction	
May	73,200	1.33		
June	88,200	1.60		
July	81,600	1.48		
August	84,600	1.54	21,465	1.07
September	88,200	1.60	19,665	0.98
October	78,300	1.42	16,165	0.81
November	61,500	1.12	17,665	0.88
December	71,400	1.30	14,165	0.71
January	74,400	1.35	18,265	0.91
February	74,700	1.36	21,665	1.08
March	75,900	1.38	17,365	0.87
April (Estimated)			16,065	0.80
May (Estimated)			17,065	0.85
June (Estimated)			19,065	0.95
July (Estimated)			21,065	1.05
ANNUAL TOTAL/AVERAGE	928,800	1.41	219,680	0.92
Cost Savings Overhead vs. Underfloor Air				-35% KWH/sft savings

The building utilizing underfloor air and air towers utilized 35% less energy per square foot. Additionally, this translated to a cost savings of approximately $0.53/sft annually.

Flexibility Extends Building Life

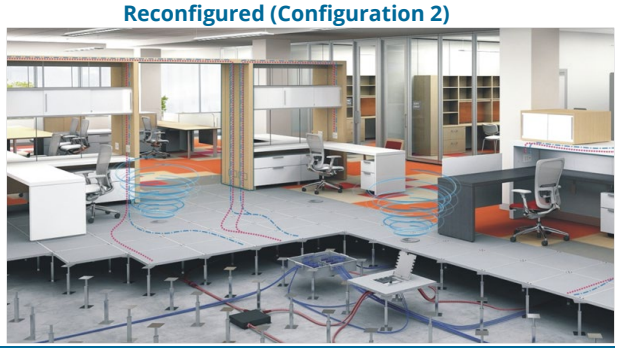
Enhanced function of the building results from flexible floor plans.

- Incorporating modular power and underfloor air allows our customers to create high performance buildings facilitating more flexible spaces and cleaner air.

- Reusing components - Modular power wiring can be reused to rewire spaces in an existing building, UFAD components can be reused, Access Floor panels can be moved.

Configuration 1

Reconfigured (Configuration 2)



Bottom Line: Utilzing Underfloor Air, Modular Power and Raised Access Floor is the best way to build modern buildings or update older buildings to reduce the carbon footprint.