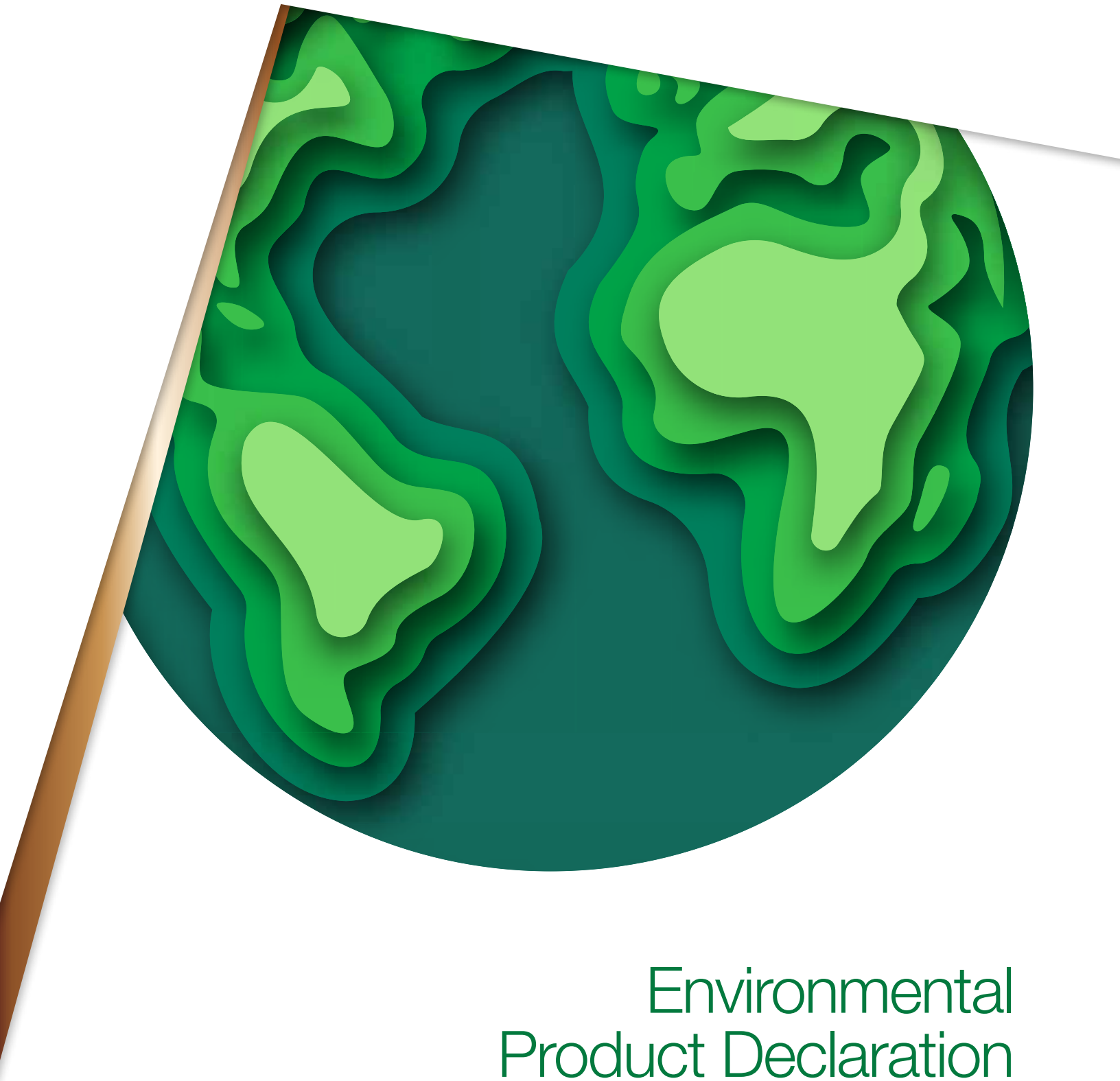
HUNTSMAN

BUILDING SOLUTIONS



Environmental Product Declaration

Introduction to Global Warming Potential (GWP)

Definitions:

Greenhouse Gases (GHG):

- Absorb energy and trap heat in the atmosphere, effectively warming it.
- Heat-trapping potential and atmospheric lifetime specific to each GHG.

Global Warming Potential (GWP):

- Metric that compares the global warming impact of those different GHGs.
- Measures how much energy the emissions of 1 ton of a GHG will absorb over a given period relative to 1 ton of CO2; expressed in Carbon Dioxide Equivalent (CO2-eq.).

The higher the GWP, the more a gas warms the planet compared to CO^2 over a period of 100 years.

Worldwide Issue: Global Warming

Two main types of carbon emissions (GHG) in buildings that contribute to the GWP:

1) Embodied carbon of construction materials
2) Operational carbon of buildings (e.g. HVAC)

PROBLEM:
Construction & Building Operations
- 38% of global annual GHG emissions

PROBLEM:
World's building stock expected to double by 2060
- ++ energy consumption; ++ carbon emissions

RESPONSE TO PROBLEM:
Paris Agreement's goals:
- Limit global warming to 2º, pref. 1.5º C from pre-industrial levels (IPCC AR5)
- 2030 » >50% carbon emission reductions
- 2050 » Zero Carbon

Addressing upfront carbon by changing the way buildings are designed, built, used and decommissioned will be a priority over the coming decades.

Global CO2 Emissions by Sector

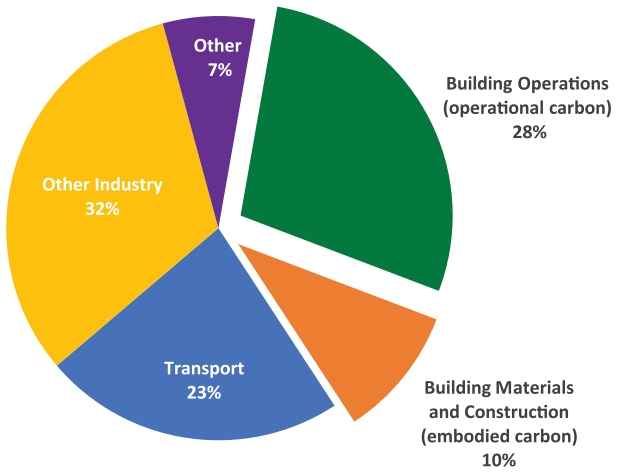


Chart source: © 2021 Huntsman Building Solutions. All rights reserved.
Data sources: UN Environment Global Status Report 2020;
IEA Energy Technology Perspectives 2020; IEA World Energy Balances 2020

HBS' SPF's Contribution to Reducing Construction And Buildings' Global CO2 Emissions

1) Reduced embodied carbon of HBS products as demonstrated in HBS-specific EPD & LCA.
2) Reducing operational carbon of buildings through continuous air sealing & increased energy performance.

ENVIRONMENTAL PRODUCT DECLARATION

HEATLOK HFO & HEATLOK SOYA HP

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Environmental Product Declaration

- Heatlok HFO/Heatlok Soya HP: 1st SPF product line with a product-specific Type III EPD, third- party made and externally verified by UL in accordance with ISO 14025, ISO 14044, ISO 21930 and EN 15804.
- Based on Cradle-to-Grave Life-Cycle Assessment which communicates transparent, objective and comparable information about the entire life-cycle environmental impact of products.
- HBS' proprietary polyol with recycled content & the new-generation Solstice HFO blowing agent with a GWP=1 responsible for diminished environmental impact.
- 250 million PET bottles recycled every year.

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Huntsman Building Solutions is a global leader in the manufacture and supply of open-cell and closed-cell spray polyurethane foam (SPF) insulation and coatings. Formed in May 2020 through the combination of the Demilec and Icynene-Lapolla SPF businesses, Huntsman Building Solutions is a business unit of Huntsman Corporation and has a combined heritage of more than 110 years. Through the application of innovative technology and advanced science,

Huntsman Building Solutions focuses on meeting market demands for more energy-efficient products and serves a range of industries, including residential, commercial, industrial, institutional, and agricultural. For more information, visit www.huntsmanbuildingsolutions.com.

UL CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

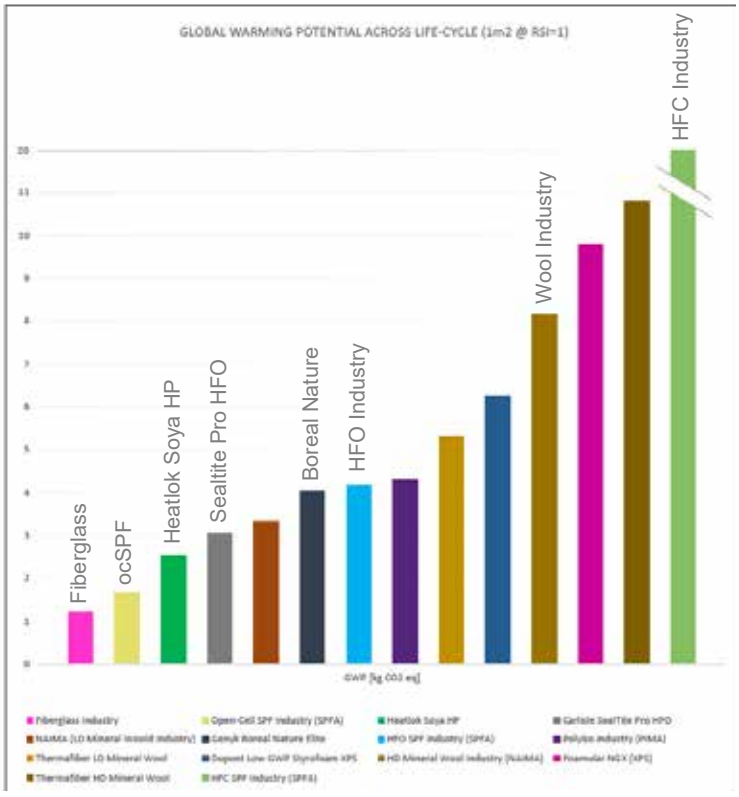


Chart source: © 2021 Huntsman Building Solutions. All rights reserved.
Data sources: Products' respective EPDs.

Environmental Product Declarations (EPD)GWP Comparisons

Innovation in SPF = new generation of products with significantly reduced embodied carbon compared to other insulations.

Embodied Carbon Take-aways:

- HFO vs HFC Industry: **80%** reduction
- Heatlok Soya HP vs HFO Industry: **39%** reduction
- Heatlok Soya HP vs Mineral Wool Industry: **70%** reduction
- Heatlok Soya HP vs Carlisle Sealtite Pro HFO: **17%** reduction
- Heatlok Soya HP vs Genyk Boreal Nature: **37%** reduction

EPDs assume a 75-year lifespan. In reality, replacing fiberglass only once doubles its embodied carbon and makes it equivalent to Heatlok Soya HP.
Spray foam's slightly higher embodied carbon than fiberglass is offset through product durability, assembly comparisons, and/or energy efficiency (GWP Payback Period).

THE MOST EFFICIENT WAY TO DECARBONIZE THE BUILDING ENVELOPE IS TO USE LESS PRODUCTS!

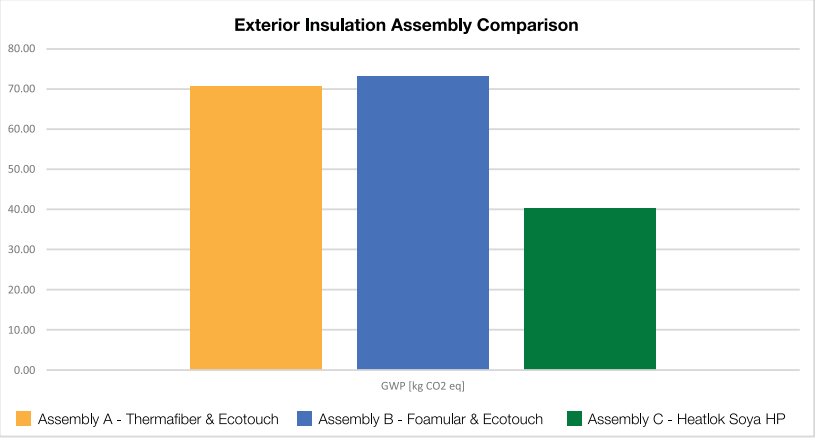
Heatlok Soya HP, being multi-functional with its thermal insulation, air and vapour barrier properties, replaces several products by a single one. As such, it effectively decarbonizes the building envelope.

By simply replacing fiberglass with outbound mineral wool or boardstock insulation and their required membranes in traditional assemblies by the single product Heatlok Soya HP at an equivalent R-value, assembly's embodied carbon nearly cut in half.

Assembly Comparisons

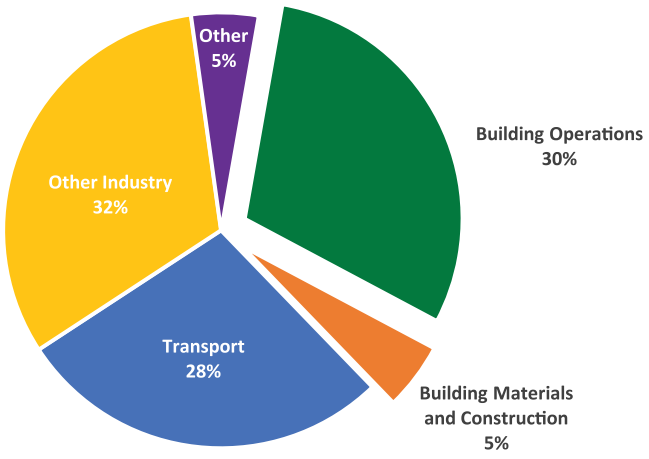
Wall assembly with only Heatlok Soya HP vs assemblies insulated with mineral wool, HFO extruded polystyrene board stock and fiber glass insulation. By simply replacing all insulation and membranes in assemblies A and B with a unique product Heatlok Soya HP at an equivalent R-value, provides 45% GWP reduction.

A/B » C = 45% GWP ↓



Data sources: Products' respective EPDs.

Global Energy Use by Sector



Energy Efficiency

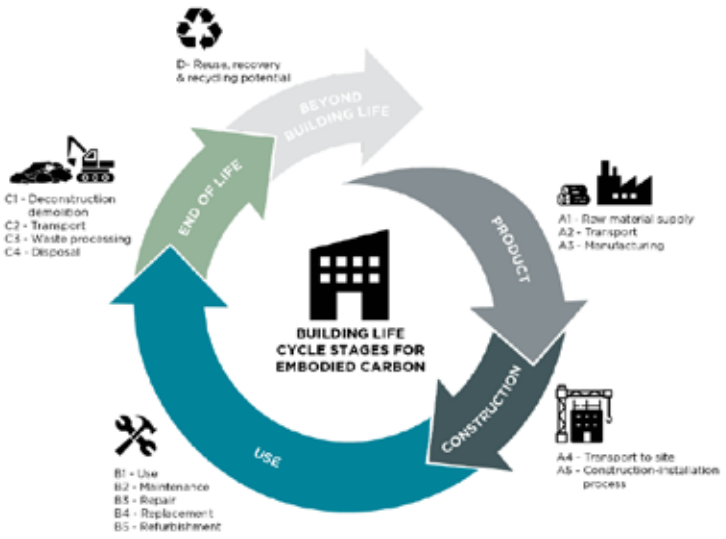
- Building Operations: 30% of global annual energy use
- HBS' SPF: Inherently seamless and higher thermal insulation, vapor and air barrier properties increase energy savings, reduce HVAC loads & lower building operational carbon emissions.
- Using spray foam in place of other products could reduce annual home heating and cooling-related carbon emissions by 30% (American Chemistry Council).

Carbon Savings Through Energy Efficiency

EPD	Embodied Carbon (1m2)	Yearly Carbon Emission Reductions through energy savings	GWP Payback Period	Lifetime Carbon Savings	Return on Invested Carbon
HFO Industry	4.16 kg	1556 kg CO2/year	**7-8 years**	**>104 tCO2**	**8x**
Heatlok Soya HP	2.53 kg	1556 kg CO2/year	**3-4 years**	**>110 tCO2**	**11x**
Open-cell SPF	1.65 kg	1556 kg CO2/year	**2-3 years**	**>112 tCO2**	**14x**

Chart source: © 2024 Huntsman Building Solutions. All rights reserved. Data source: SPFA "Counting Carbon" Energy Study. GWP Payback Period will be longer in regions with predominantly clean energy sources (e.g. hydroelectricity).

- Our SPF insulation reduces air infiltration into buildings, decreasing the energy required for heating and cooling.
- After offsetting its higher embodied carbon vs fiberglass, it then decarbonizes buildings throughout their lifetime.
- One ton of carbon emitted from the production of our spray polyurethane insulation results in 11 and 14 tons of carbon avoided.
- SPF insulation offers the best Return on Invested Carbon in the market.



LEED & Other Sustainability Benefits

- HBS' SPF keeps building components in better condition longer, giving buildings longer lifespans, which promotes the reuse of materials & buildings to reduce the reliance on new construction and the need for virgin materials.
- Waste reduction during construction
- Contains recycled & renewable content
- Exceeds indoor air quality standards
- Greenguard Gold-Certified

UBC EMBODIED CARBON PILOT - BILL OF MATERIALS GENERATION METHODOLOGY, March 2021.

HBS' SPF products help achieve LEED and other programs' sustainability goals of reducing whole building life-cycle impacts.

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