



# ACMA Sustainability Programs

ACCE Conference  
September 2023



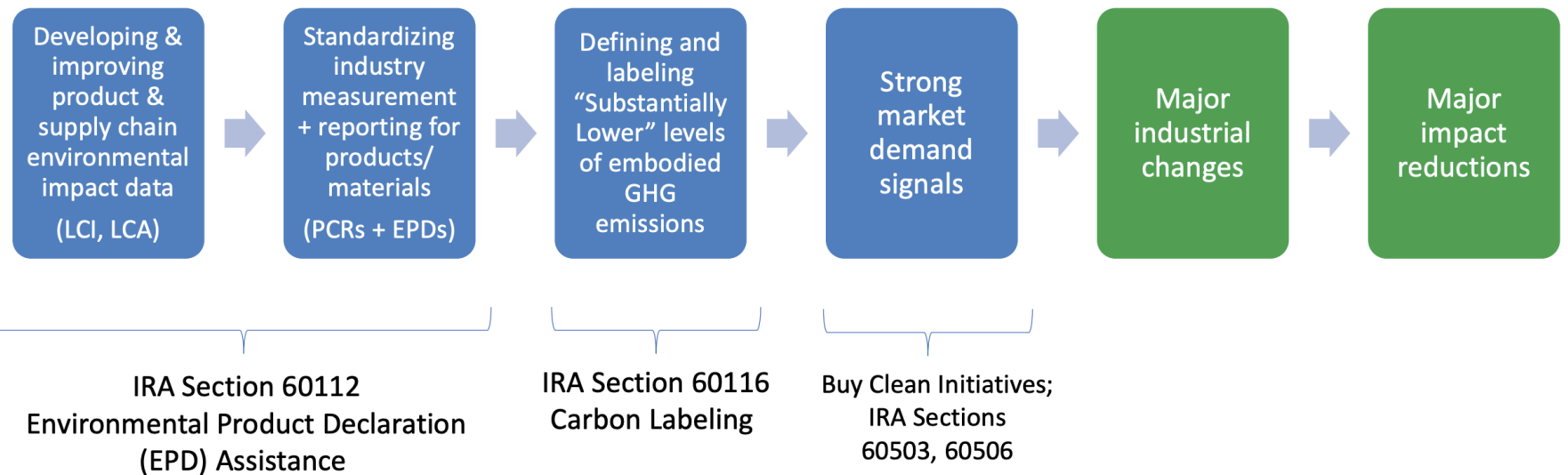
# Inflation Reduction Act of 2022



## Inflation Reduction Act provides a boost for the Federal Buy Clean Initiative with \$4.5 billion in funding for the General Services

- The **Department of Transportation (DOT)** has successfully included environmental criteria in several discretionary grant programs to incentivize the use of products and materials that reduce carbon emissions. In June 2022, the Department's Chief Sustainability Officer along with the Office of the Senior Procurement Executive also launched a Lower Carbon Procurement Pilot to increase utilization of environmental product declarations (EPDs) and encourage the acquisition of products and materials with low embodied carbon emissions. In April 2022, the Federal Highway

## High-Level Theory of Change



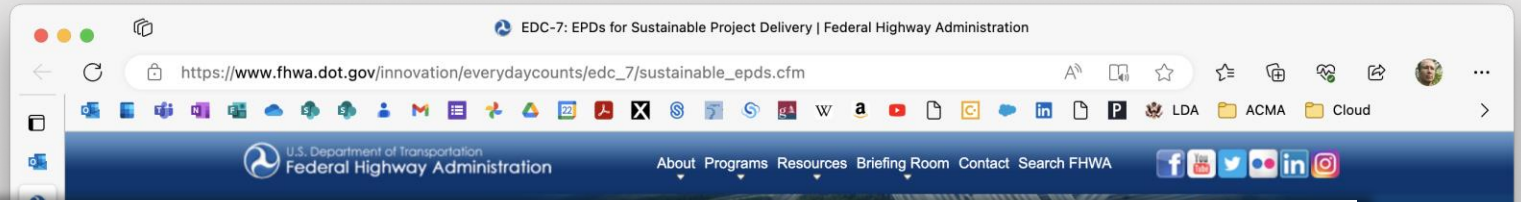


All about EPDs...

An EPD is a third-party verified “nutrition label” for the environmental impacts of your product, and the process for getting one is similar. You will need:

1. Sustainability professional(s) to help you analyze the data and generate a report.
2. A Program Operator to verify and publish your declaration.
3. Data about the inputs to your product, energy consumed, and any chemical process emissions.
4. A set of Product Category Rules (PCR) under which to standardize your declaration.

<b>Product Impacts</b>	
Declared Unit: 1 m <sup>3</sup> of 10,000 psi concrete at 28 days	
<b>Amount Per Declared Unit</b>	
<b>Global Warming Potential</b>	445 kgCO <sub>2</sub> eq
Emitted	460 kgCO <sub>2</sub> eq
Sequestered	-15 kgCO <sub>2</sub> eq
<b>Ozone Depletion</b>	0.000 kgCFC11eq
<b>Acidification</b>	2.96 kgSO <sub>2</sub> eq
<b>Eutrophication</b>	0.09 kgNeq
<b>Smog Formation</b>	0.61 kgO <sub>3</sub> eq
<b>Primary Energy Demand</b>	3017 MJ
Non-renewable	3000 MJ
Renewable	17 MJ



**An Environmental Product Declaration (EPD) is a tool that can demystify the environmental impacts of construction materials.**

As State departments of transportation (DOTs) become increasingly conscious of infrastructure's environmental burdens and seek more sustainable strategies, they are

## A Simple Yet Robust Environmental Reporting Tool

The manufacture, transportation, and production of construction materials such as

### Benefits

**Sustainable Procurement.** EPDs encourage the demand and supply of products that promote the more sustainable use of resources and create less stress on the environment.

**Sustainable Design.** EPDs provide critical information for use in conceptual- and project-level full LCAs or other types of environmental assessment of alternative design decisions. EPDs allow for meaningful information of environmental performance for construction materials.

**Sustainable Asset Management.** EPD data can be included in databases used in asset management systems to perform network-level LCAs and identify areas for environmental performance improvement.

ment  
t used to

s are

g life-

third-

support

s at

projects.



Source: FHWA

on  
f Infrastructure  
@dot.gov



**An LCA can include the:**

- Manufacture of raw materials, including natural resource extraction and processing
- Manufacture of the product
- Transportation of raw materials and finished product
- Use of the product
- Disposal of the product

**Environmental impacts considered can include:**

- Emission of climate warming gases
- Air quality (toxics, VOCs, PM, NOx, PAH, metals, etc.)
- Water quality (fresh water used, discharges to water)
- Solid waste (amount generated, % hazardous)

A **Life Cycle Assessment** is a systematic analysis, using data from the LCI, of environmental impact over the course of the entire life cycle of a product, material, process, or other measurable activity.

The LCA prepared by the manufacturer of a composite product provides an estimate of climate impact

Life Cycle Inventory (LCI)

A **Life Cycle Inventory** involves identifying and quantifying all resources used to produce the product, such as energy, water, raw materials and processed materials, and all substances released into the environment, such as the emission of pollutants into the air, soil and water, and losses resulting from the production and consumption of the product. Outputs are expressed in terms of standardized units; e.g., tons CO<sub>2</sub>-equivalent emitted per 10,000 tons of product produced

Selection/deselection of components based on suppliers' progress toward Carbon Net-Zero

End-user's ESG Report uses data from supplier's LCA to report progress toward Carbon Net-Zero

Publicly-traded companies provide **Environment, Social and Governance** Reports to inform stockholders and the public about progress toward goals such as achieving Carbon Net-Zero.

The Securities and Exchange Commission and the Environmental Protection Agency are expected to establish standards for consistency and reliability of ESG reporting. Global standards have been released in draft form

**Carbon Net-Zero** means the elimination of any contribution of the company's operations (including manufacture of raw materials and use of products) toward climate change

Product Category Rule (PCR)

A **Product Category Rule** is a standardized procedure, developed according to ISO criteria, for preparing EPD for a certain product category. A PCR for steel products for construction and infrastructure exists and is being used to prepare EPDs, e.g., for steel rebar

PCR and data from LCA used by manufacturer to prepare EPD

An **Environmental Product Declaration** is a summary of a product's LCA prepared using certain standards for consistency and reliability, allowing comparison of the environmental impacts of similar products; e.g., steel v. composite rebar

EPA EPD database; Designation of low-embedded carbon products (EPA)

The Build Back Better act requires EPA to set up a **database of EPD's** for construction and infrastructure materials and products. Based on comparison of EPDs, EPA will designate some products as **low embedded carbon products**

Selection of products by State DOTs and infrastructure designers



Construction works assessment information														
Construction works life cycle information within the system boundary											Optional supplementary information beyond the system boundary			
A1 - A3 PRODUCTION Stage (Mandatory)			A4 - A5 CONSTRUCTION Stage		B1 - B7 USE Stage					C1 - C4 END-OF-LIFE Stage				D
A1	A2	A3	A4	A5	B1	B2	B3	B4 <sup>a</sup>	B5	C1	C2	C3	C4	
Extraction and upstream production	Transport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance (incl. production, transport and disposal of necessary materials)	Repair (incl. production, transport and disposal of necessary materials)	Replacement (incl. production, transport and disposal of necessary materials)	Refurbishment (incl. production, transport and disposal of necessary materials)	De-construction / Demolition	Transport to waste processing or disposal	Waste processing	Disposal of waste	Potential net benefits from reuse, recycling and/or energy recovery beyond the system boundary
			Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario
					B6 Operational energy use									
					Scenario									
					B7 Operational water use									
					Scenario									

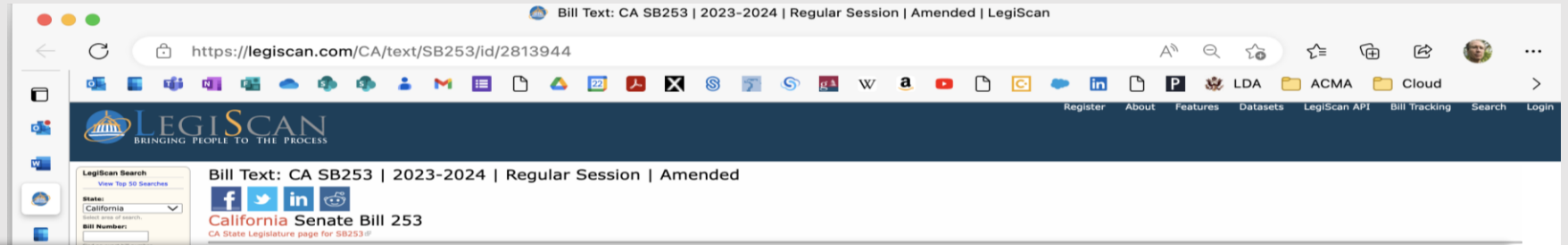
**Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services**

*Développement durable dans les bâtiments et les ouvrages de génie civil — Règles principales pour les déclarations environnementales des produits de construction et des services*





# California and other foreign countries



**SB 253, as amended, Wiener. Climate Corporate Data Accountability Act.**

Scope 3 includes supply chain impacts

The California Global Warming Solutions Act of 2006 requires the State Air Resources Board to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with the act...

This bill would require the state...to adopt regulations requiring United States...corporations...and other business entities with total annual revenues in excess of \$1,000,000,000 and that do business in California...to publicly disclose...their greenhouse gas emissions, categorized as scope 1, 2, and 3 emissions...from the prior specified calendar year...

The bill would require reporting entities to ensure that their public disclosures have been independently verified by the emissions registry or a third-party auditor...



### EU Finalizes ESG Reporting Rules with International Impacts

Supported By:

The European Union has **finalized** the Corporate Sustainability Reporting Directive (“CSRD”) that will introduce more detailed sustainability reporting requirements for EU companies, non-EU companies meeting certain thresholds for net turnover in the EU and companies with securities listed on a regulated EU market. The CSRD entered into force on January 5, 2023 and is substantially consistent with the provisional version published in June 2022.

The rules will be phased in starting from January 1, 2024 for certain large EU and EU-listed companies, and will apply to all in-scope companies by January 1, 2028.

model impacts sustainability factors. The scope of required reporting covers environmental, social and human rights and governance factors. Environmental factors include not only climate (including **Scopes 1, 2 and 3 greenhouse gas emissions**) but also water/marine resources, circular economy, pollution and biodiversity. The precise disclosure requirements are being developed for the European Commission by the European Financial Reporting Advisory Group (“EFRAG”), a non-profit advisory

With the provisional version published in June 2022.

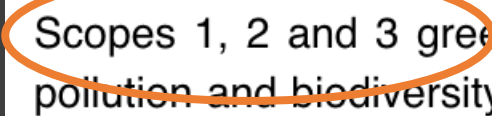
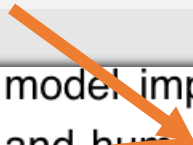
The rules will be phased in starting from January 1, 2024 for certain large EU and EU-listed

Bruce H. Goodhart Williams

Joseph Hall

Daniel Wolf

Scope 3 includes supply chain impacts





Auto OEMS



## FORD COMMITS TO CARBON NEUTRALITY BY 2050

FORD MOTOR COMPANY INTENDS TO ACHIEVE CARBON NEUTRALITY GLOBALLY BY 2050, WHILE SETTING INTERIM TARGETS TO MORE URGENTLY ADDRESS CLIMATE CHANGE CHALLENGES.

- To achieve its goal, Ford will focus on three areas that account for about 95 percent of its CO2 emissions – vehicle use, supply base and company's facilities

emissions in line with the Paris Climate Agreement and working with California for stronger vehicle greenhouse gas standards

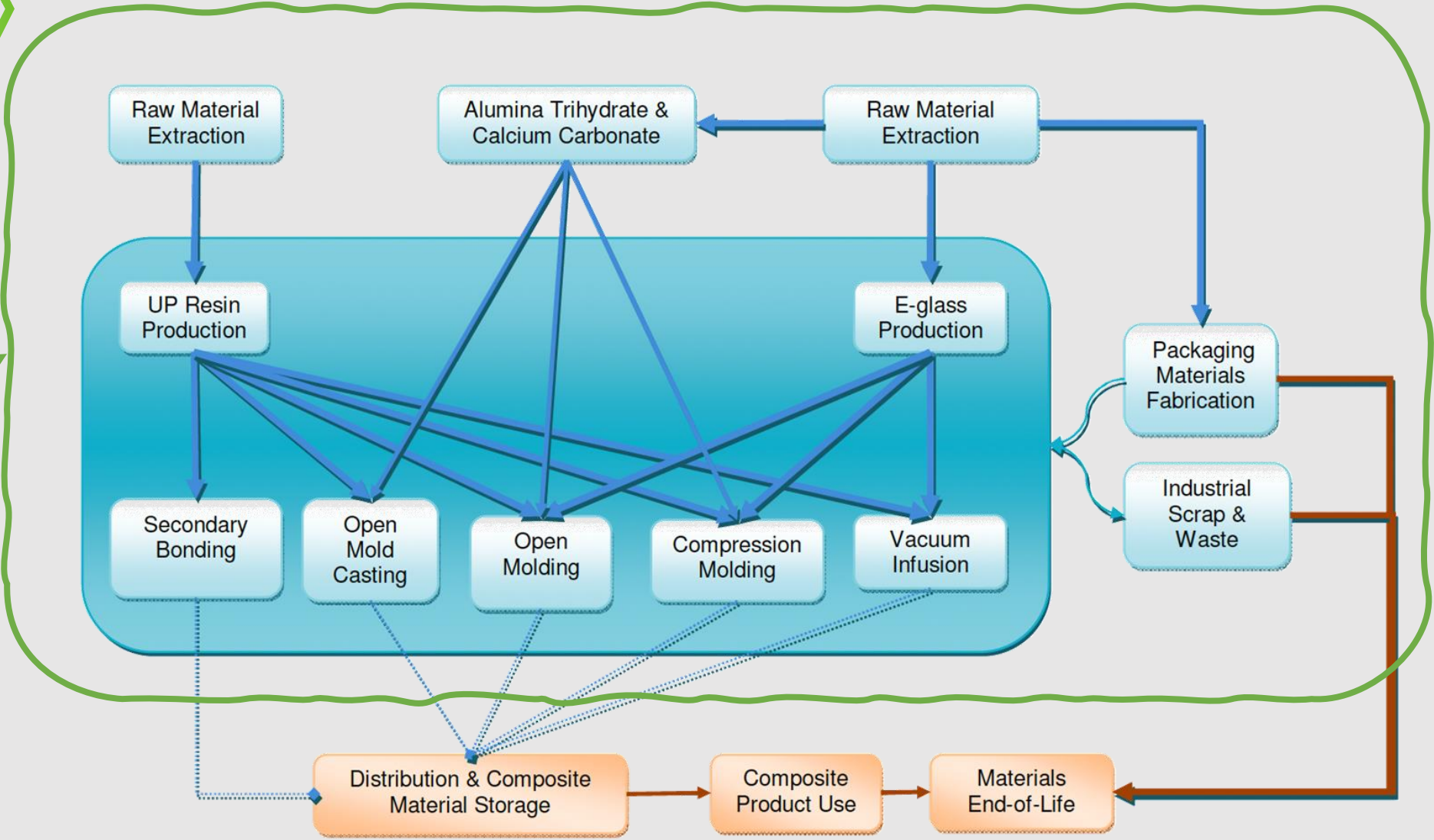
- To achieve its goal, Ford will focus on three areas that account for about 95 percent of its CO2 emissions – vehicle use, supply base and company's facilities

- To date, Ford is investing more than \$11.5 billion in electric vehicles through 2022, including forthcoming zero-emission Mustang Mach-E, Transit Commercial and fully electric F-150



## ACMA's Climate Impacts Data

Boundary of ACMA cradle-to-gate analysis





Manufacture of		Cradle-to-gate CO2e emission ratio
Glass fiber		2.3
Carbon fiber (JCFMA)		19.8
Unsaturated polyester resin		3.1
Vinyl ester resin		3.5
Polyurethane	Polyether polyol	2.8
	MDI	2.5
Epoxy (Reported calculation)		6.7

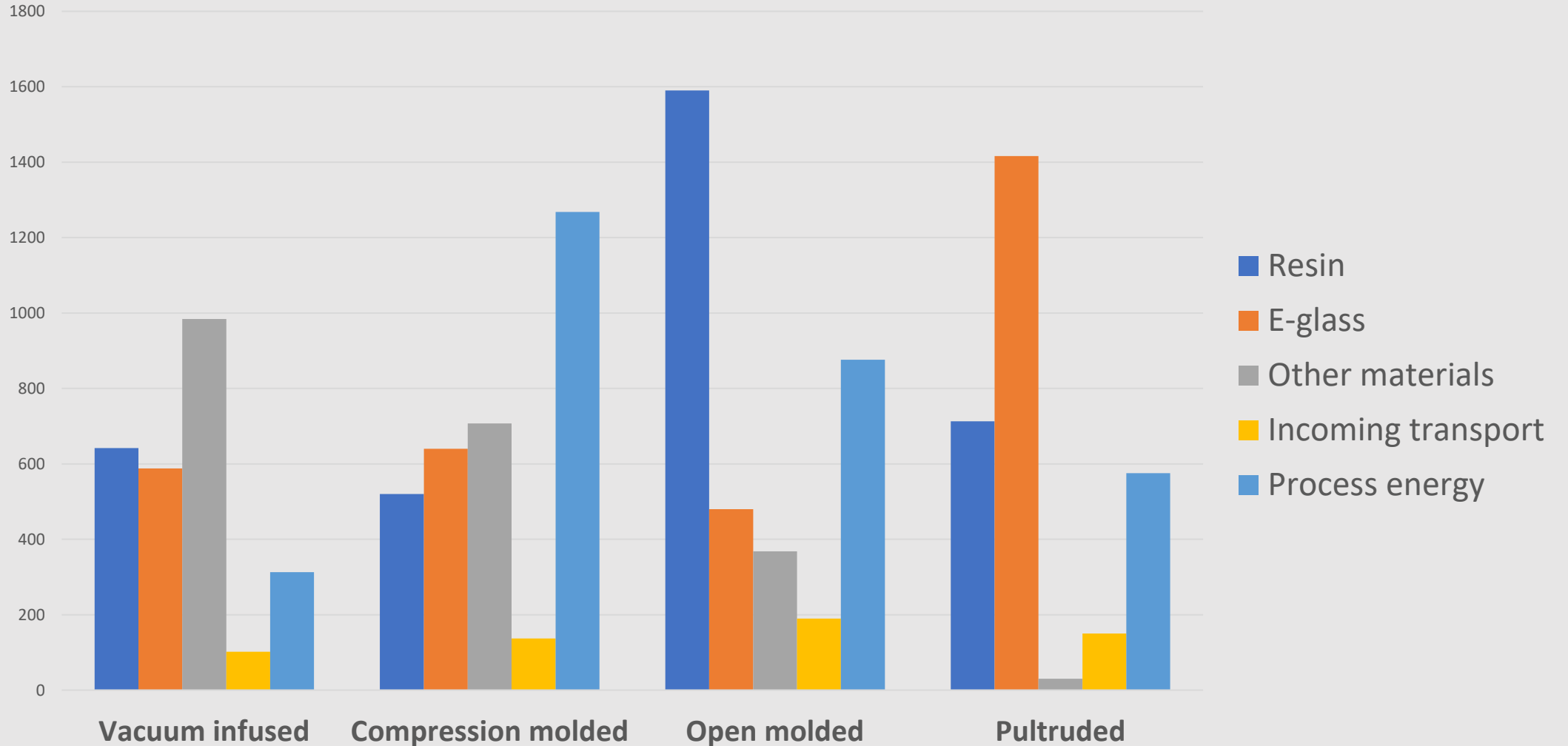
Source: ACMA Climate Impacts Project, unless otherwise source noted



<b>Manufacture of</b>	<b>Cradle-to-gate CO2e emission ratio</b>
Open molded composite product	3.5
Compression molded product	3.2
Vacuum infused product	2.6
Pultruded product	2.7

Source: ACMA Climate Impacts Project

### CO2e emission per input





## **Sustainability objectives –**

Reduce costs and uncertainty associated with LCAs and EPDs

Compete successfully in sustainability-driven markets

Facilitate decarbonization of composite products