



# AGGREGATES INDUSTRY SUSTAINABILITY INITIATIVES: CHALLENGES AND OPPORTUNITIES

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POLICY

THURSDAY, JAN 25TH

**NSSGA**<sup>®</sup>

NATIONAL STONE, SAND  
& GRAVEL ASSOCIATION

# PART 1

- Introduction



## WHO WE ARE?

- Our members are stone, sand and gravel producers, as well as those who provide equipment and services to support them. They are responsible for producing the essential raw materials found in homes, buildings, roads, bridges and public works projects across the country.
- NSSGA represents 90 percent of the crushed stone and 70 percent of the sand and gravel produced annually in America.

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## WHAT WE DO?

- NSSGA advocates for the priorities of the aggregates industry to positively impact federal public policy in legislation and regulation.
- NSSGA provides the venue for members to come together to learn, collaborate and network.
- NSSGA arms and informs our members to engage in public policy, making our collective voice greater.

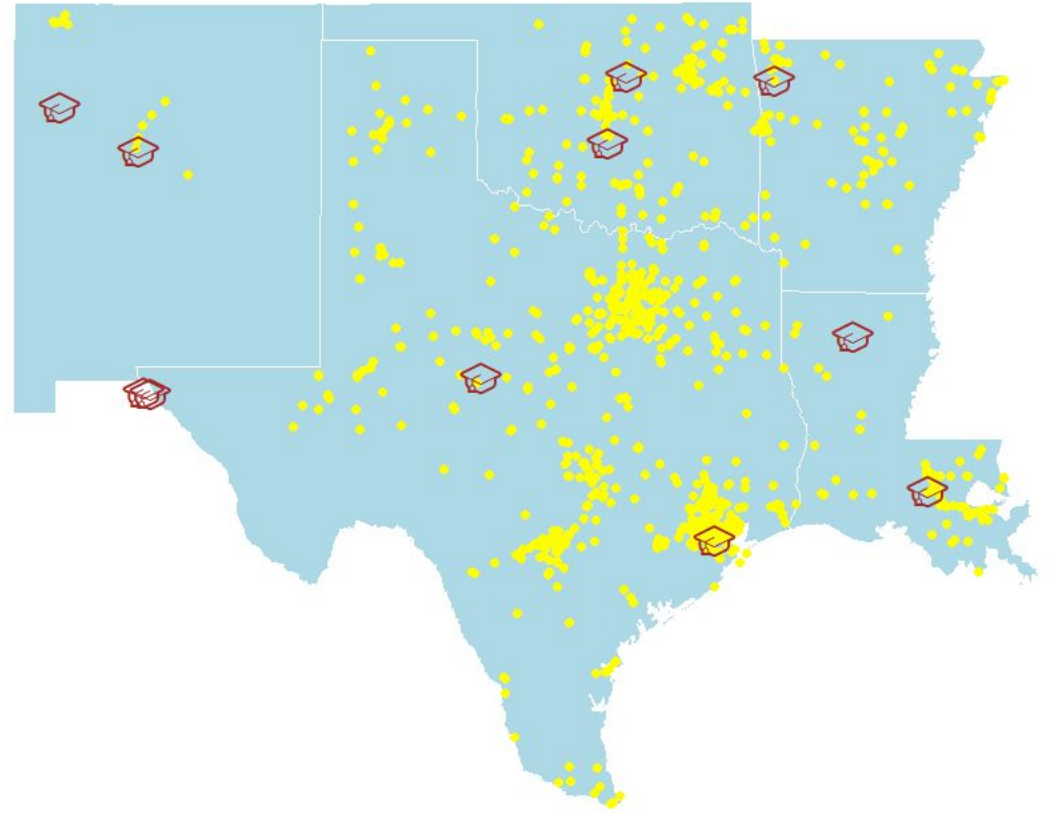


## AGGREGATES INDUSTRY

- Responsible for 100,000 jobs in the United States
- 2.8 Billion tons of aggregate (crushed stone and sand & gravel) produced annually
- 38,000 tons of aggregates are in every mile of highway
- Every American uses about 680 tons of aggregate during their lifetime

## OUR MEMBERS IN SPTC REGION

- Our members operates out of 1083 locations in this region (includes quarries, terminals, offices, ...)



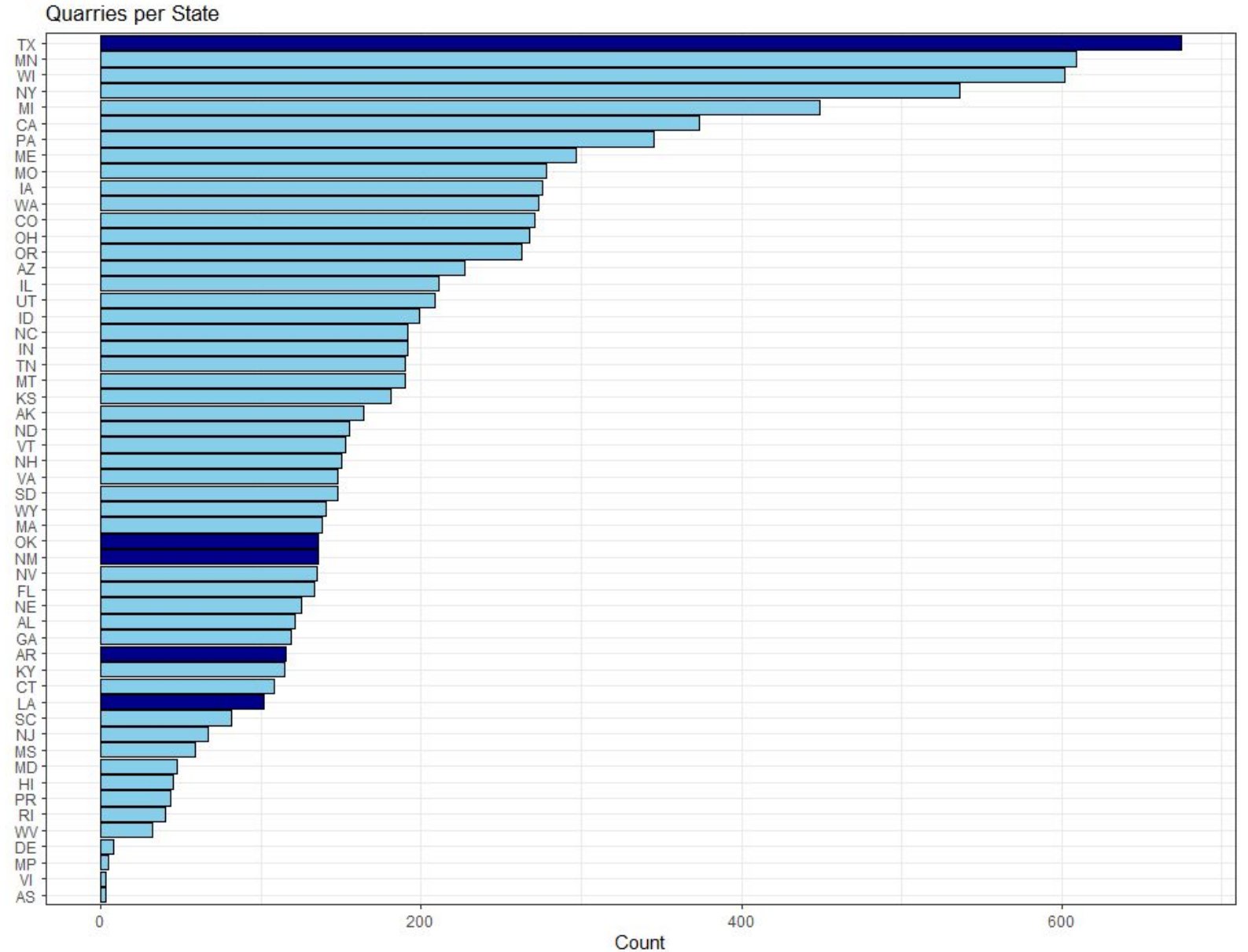
## OUR STATE PARTNERS

- Oklahoma Aggregates Association
  - Devery Youngblood
- Texas Aggregates & Concrete Association
  - Josh Leftwich
- Concrete & Aggregates Association of Louisiana
  - Michael Demouy
- New Mexico Ready Mix Concrete & Aggregates Association
  - Mandi Aldaz



# TOTAL NUMBER OF QUARRIES IN THE SPTC REGION

State	No. of Quarries
TX	675
NM	136
OK	136
AR	116
LA	102
<b>Total</b>	<b>1,165</b>





# PART 2

- Sustainability in General

# SUSTAINABILITY





## SOCIAL

- Participate in social license to operate
  - Participate and host community events
  - Donate materials, reclaimed mine sites, and pit reservoirs to local communities
  - Mining and geological tours and classes offered to local educators
- Evolving workforce needs

## ECONOMIC

- Efficient operations and equipment have less down time and less energy demand on the grid
- Finding engineered uses for byproducts created by production process
- Increased reserves and mine life

# ENVIRONMENTAL

- Concurrent reclamation projects part of initial and final mine plans



- Investments in renewable energy for on-site power
- Water monitoring and improvements
- Overall efficiencies

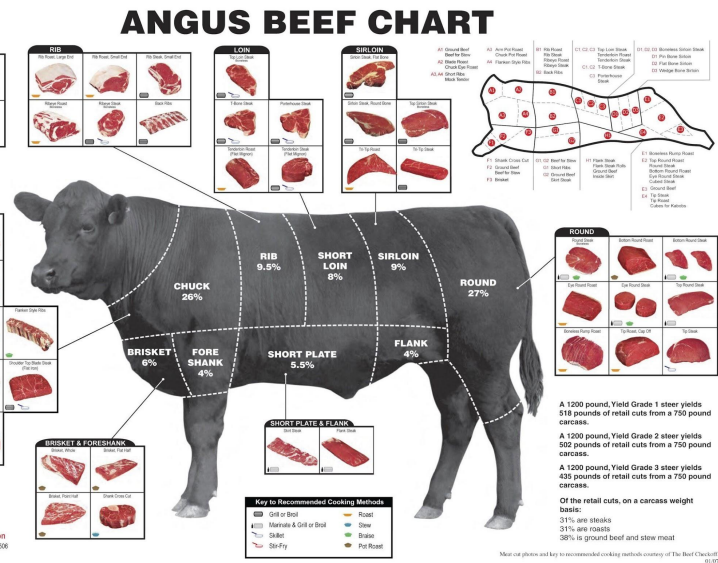
# QUARRY BYPRODUCTS

- Estimated nearly 500 million tons of fine aggregates have been “landfilled”
- Typically, less than 3/8” and includes wash plant fines from cleaning construction aggregates and sand
- Dust of fracture



# PRODUCT BALLANCE

- Armor stone
- Riprap
  - Class I, II, III
- Surge
  - #1
  - #2
  - #3
- Coarse
  - #57
  - #8
- Base
  - P209
  - P304
- Fine
  - Concrete Sanc
  - Asphalt Sand

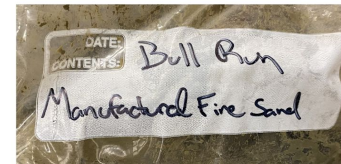


# AREAS OF RESEARCH

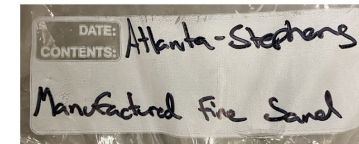
- Enhanced rock weathering
  - Carbon “mineralization” and agricultural benefits
- Innovative uses of byproducts
  - Quarry fines in 3-D printed concrete
- Equipment automation



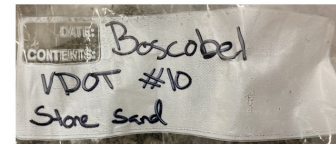
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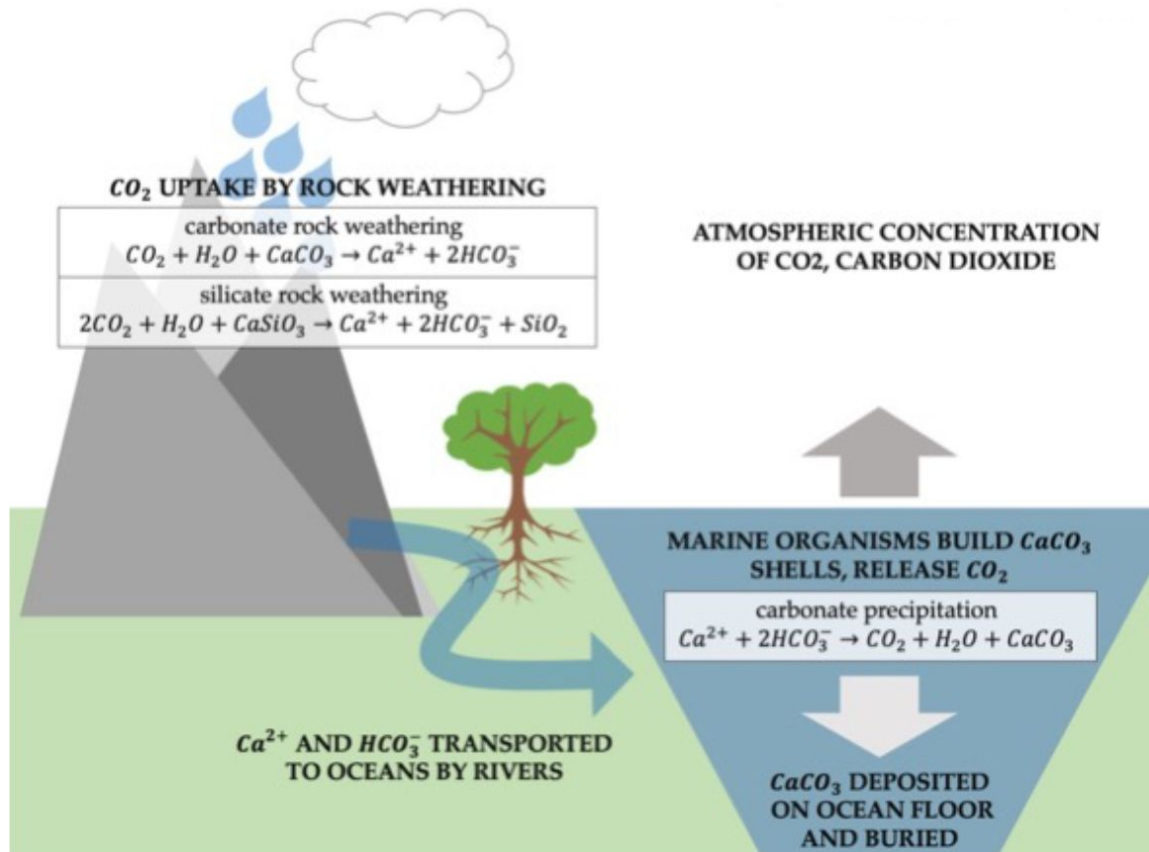
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# ENHANCED ROCK WEATHERING (ERW)







## ERW

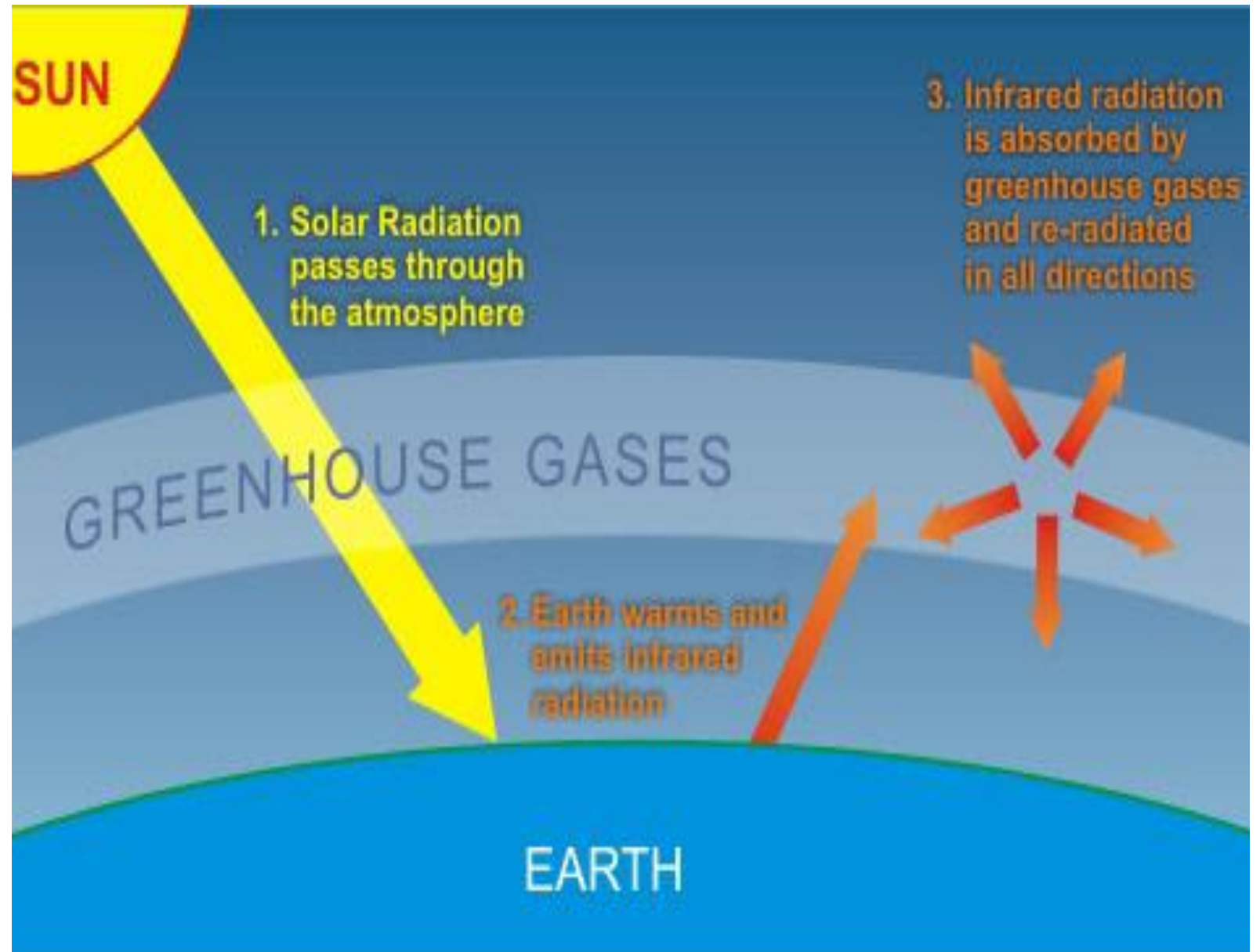
- Silicate-rich rocks react with CO<sub>2</sub> during the weathering process
- Weathering of rocks currently absorbs about 1.1 Gt CO<sub>2</sub> mainly stored as bicarbonate in the ocean
- It decreases ocean acidification too
- The enhanced rock weathering expedites the natural process by grinding rocks to increase their surface area
- There is high interest in the agricultural field, it is easy to apply, and some sources can stimulate plant growth
- Dunitite and basalt have the highest potential
- Best-suited locations are warm and humid areas
- It has the potential to sequester 95 Gt CO<sub>2</sub> globally, current annual energy-related CO<sub>2</sub> emissions are 33 Gt

# PART 3

- Climate Change

## WHY GREEN HOUSE GASES (GHG) CAUSE WARMING?

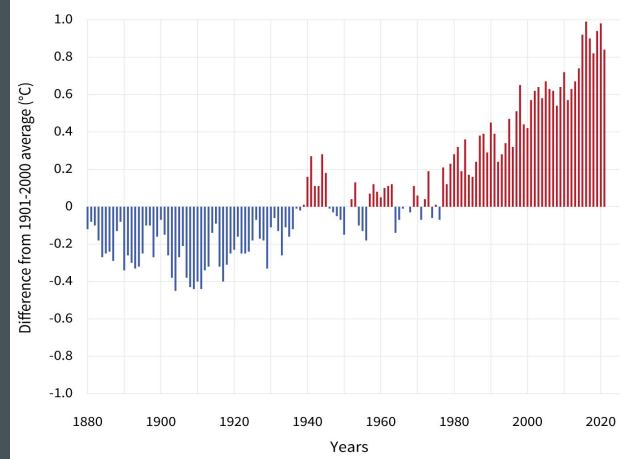
- CAUSES AN EFFECT LIKE THE GLASS IN A GREENHOUSE, TRAPPING HEAT AND WARMING UP THE INSIDE.



# HOW FAST THE WORLD IS WARMING?

■ EARTH'S TEMPERATURE HAS RISEN BY 0.08° CELSIUS PER DECADE SINCE 1880, BUT THE RATE OF WARMING SINCE 1981 IS MORE THAN TWICE THAT:

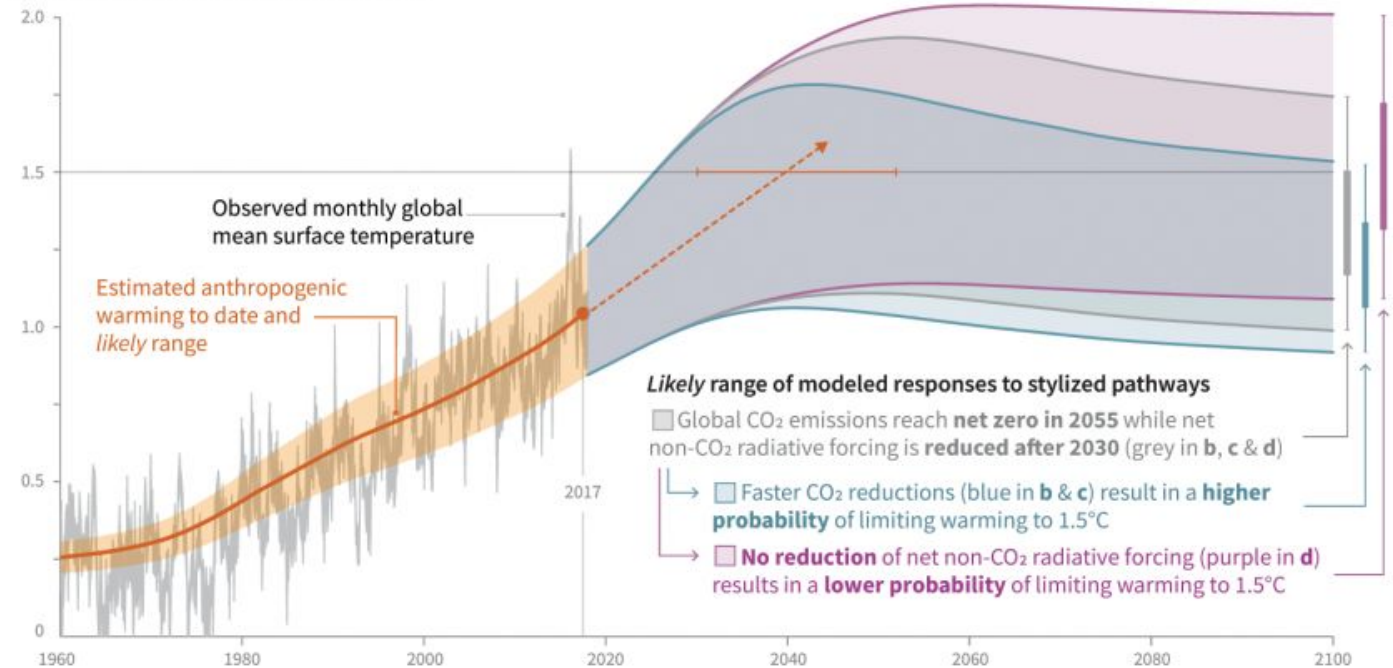
## GLOBAL AVERAGE SURFACE TEMPERATURE



## Cumulative emissions of CO<sub>2</sub> and future non-CO<sub>2</sub> radiative forcing determine the probability of limiting warming to 1.5°C

a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways

Global warming relative to 1850-1900 (°C)

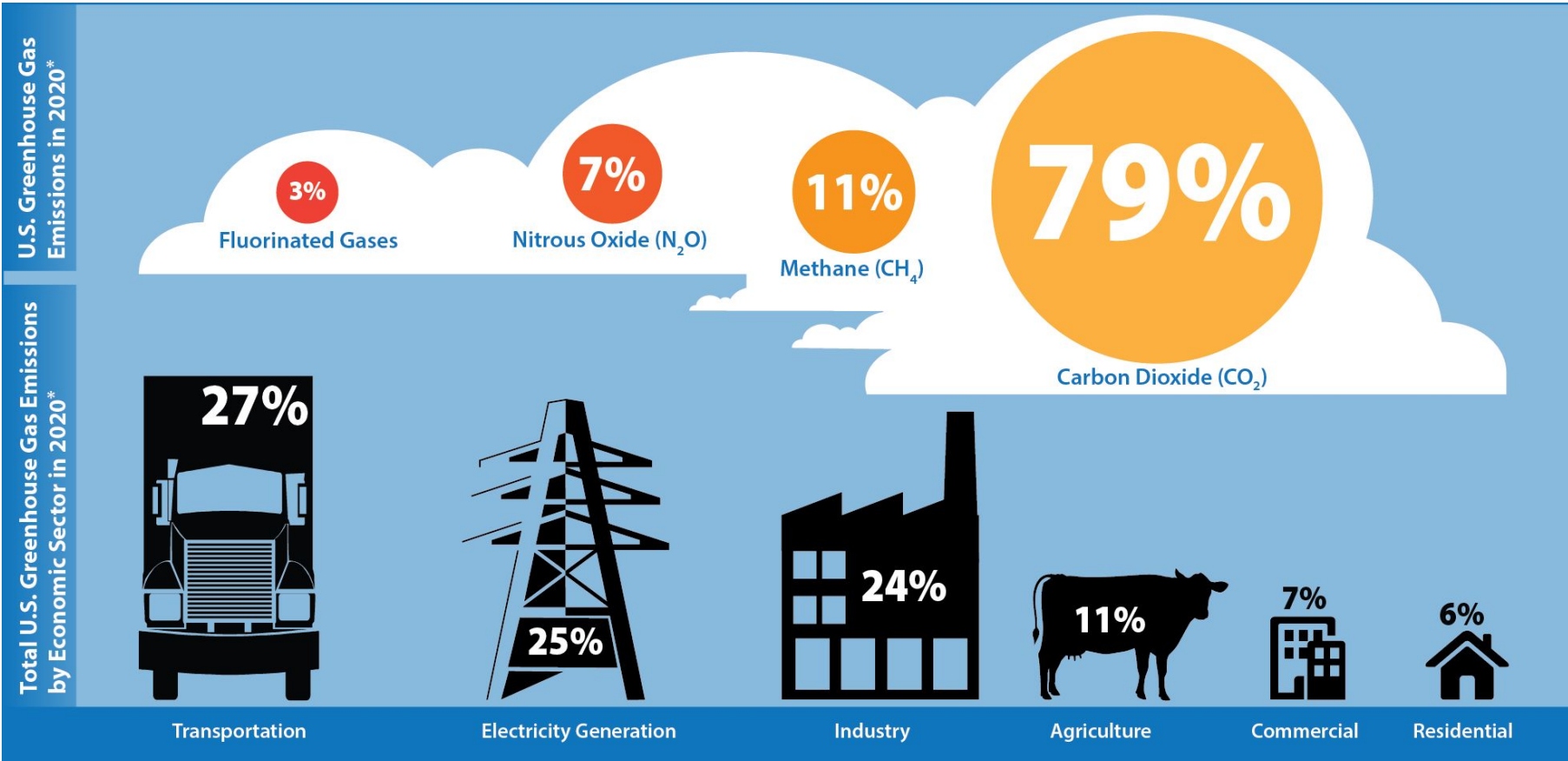


b) Stylized net global CO<sub>2</sub> emission pathways  
Billion tonnes CO<sub>2</sub> per year (GtCO<sub>2</sub>/yr)

c) Cumulative net CO<sub>2</sub> emissions  
Billion tonnes CO<sub>2</sub> (GtCO<sub>2</sub>)

d) Non-CO<sub>2</sub> radiative forcing pathways  
Watts per square metre (W/m<sup>2</sup>)

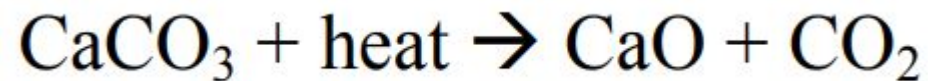
# WHY CO2 IS IMPORTANT AND WHAT ARE THE MAIN CONTRIBUTORS?



# ONE OF THE BIGGEST ITEMS ON THE TAB FOR THE INDUSTRY? CEMENT

## WHY CEMENT CO<sub>2</sub> EMISSIONS ARE SO HIGH?

- THE CEMENT INDUSTRY IS RESPONSIBLE FOR ABOUT **7%-8%** OF GLOBAL CARBON DIOXIDE EMISSIONS (SOME REPORTS ARE AS HIGH AS 12%).
- IN 2021, WORLDWIDE EMISSIONS FROM MAKING CEMENT HIT NEARLY 2.9 BILLION TONS OF CARBON DIOXIDE



- 1300-1450 °C
- SECOND ONLY TO WATER, CONCRETE IS THE MOST CONSUMED MATERIAL IN THE WORLD.
- 0.5-0.6 TON CO<sub>2</sub> PRODUCED PER TON OF CEMENT

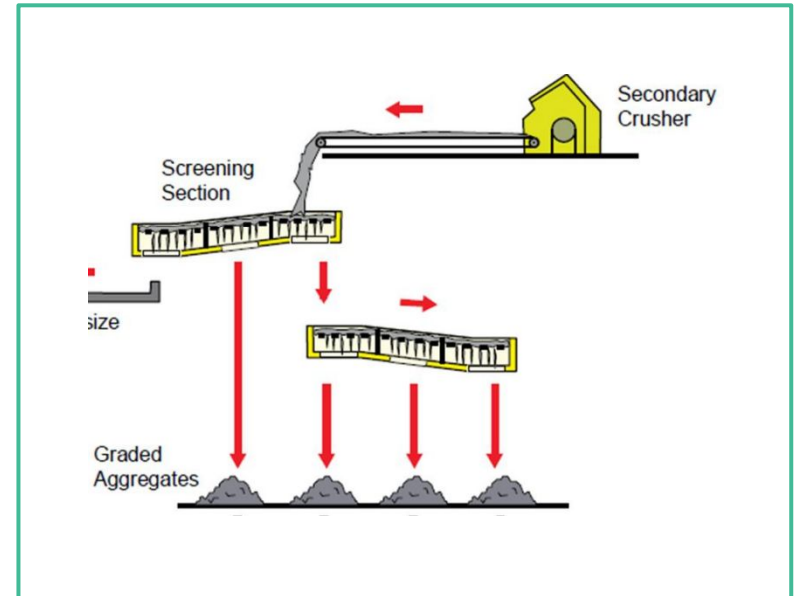
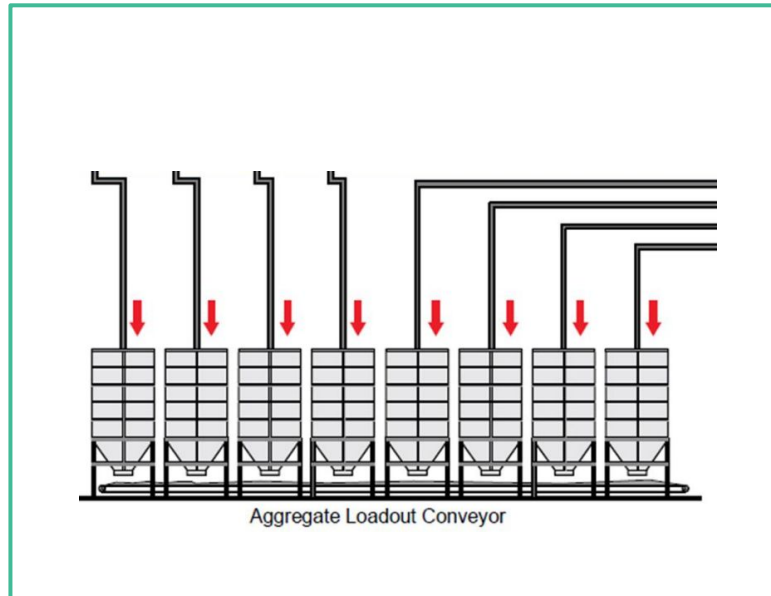
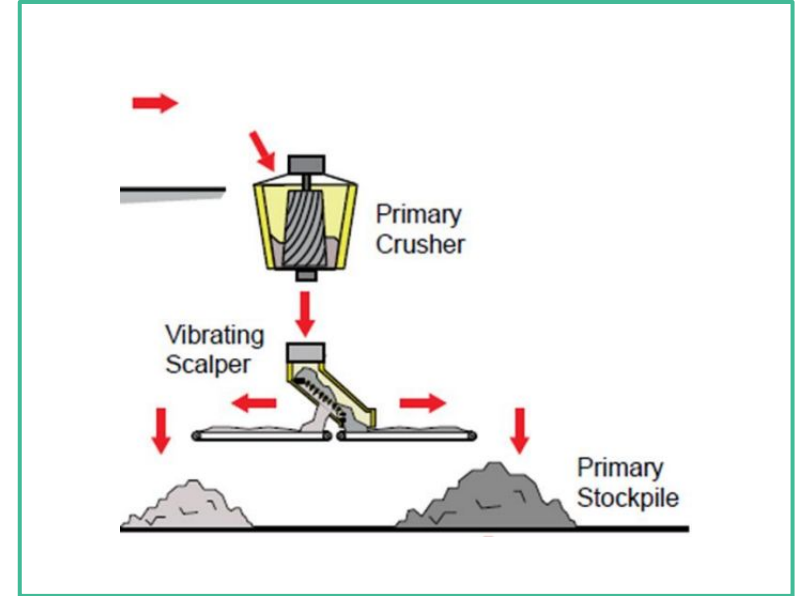
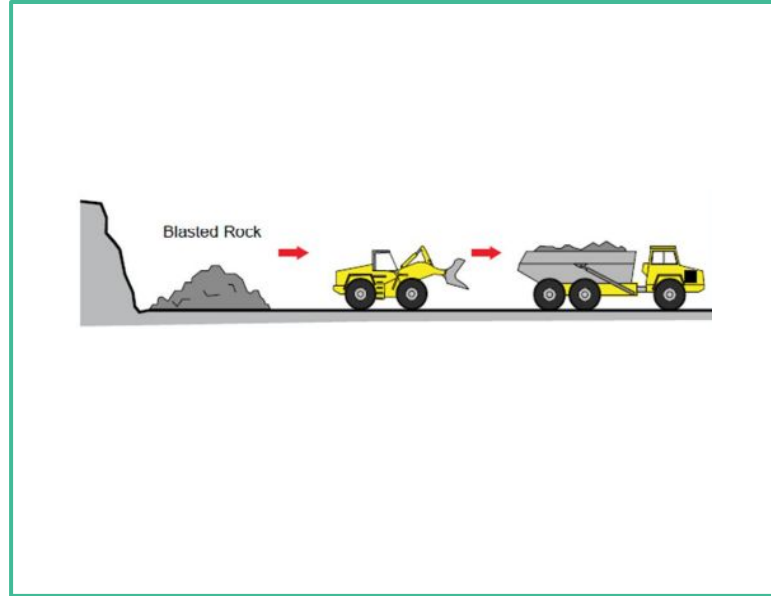
# WHAT'S EMBODIED CARBON?

REFERS TO THE GREENHOUSE GAS (GHG) EMISSIONS ASSOCIATED WITH THE MATERIALS' MANUFACTURING, TRANSPORTATION, INSTALLATION, MAINTENANCE, AND DISPOSAL.

CALCULATED AS GLOBAL WARMING POTENTIAL (GWP). EXPRESSED IN METRIC TONS OF CARBON DIOXIDE EQUIVALENT (CO<sub>2</sub>E)

# WHAT'S AN EPD?

AN ISO TYPE III ENVIRONMENTAL PRODUCT DECLARATION (EPD) IS A CRADLE TO GATE LIFE CYCLE ASSESSMENT (LCA), PREPARED ACCORDING TO THE PRODUCT CATEGORY RULE (PCR) GUIDELINES, AND HAS BEEN INDEPENDENTLY VERIFIED OF THE DECLARATION AND DATA PER ISO 14025.



## WHAT'S A PCR?

- THE ISO STANDARDS FOR LCA ARE QUITE BROAD; THUS, MORE PRECISE GUIDANCE IS NEEDED FOR THEIR APPLICATION TO A SPECIFIC MATERIAL OR PROCESS. SUCH GUIDANCE IS USUALLY DEVELOPED BY THE RELEVANT INDUSTRIES AND OTHER STAKEHOLDERS.
- A PRODUCT CATEGORY RULE (PCR) IS A SET OF GUIDELINES THAT DETERMINE WHAT DATA SHOULD BE GATHERED AND HOW IT WILL BE EVALUATED WHEN CONDUCTING THE LIFE CYCLE ASSESSMENT (LCA) OF A PRODUCT.
- ISO 21930 (CORE PCR), ISO 14025, ISO 14027, AND EN 15804 PROVIDE REQUIREMENTS FOR DEVELOPING PCR
- THE ISO REQUIRES 3 ENTITIES TO BE INVOLVED IN THE PROCESS OF DEVELOPING PCR: OPERATOR (PO), PCR COMMITTEE, PCR REVIEWER PANEL,







## NSF/ASTM 1126-23

Product Category Rule for Environmental Product Declarations

*PCR for Construction Aggregates*



**Program Operator**  
NSF International  
National Center for Sustainability Standards  
Valid through September 30, 2027

[ncss@nsf.org](mailto:ncss@nsf.org)

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# WHAT DOES AN EPD TELL?

- THE PRIMARY ENVIRONMENTAL IMPACTS PER US CUSTOMARY TON (2000LB)

As stated in ISO 21930:2017, all EPD values shall be reported using SI units, except that the declared unit is in US Customary.

GWP = Climate Challenge Impact, expressed as Global Warming Potential evaluated over 100 years, Unit kgCO<sub>2</sub>e

EP = Eutrophication Potential, Unit kgNe

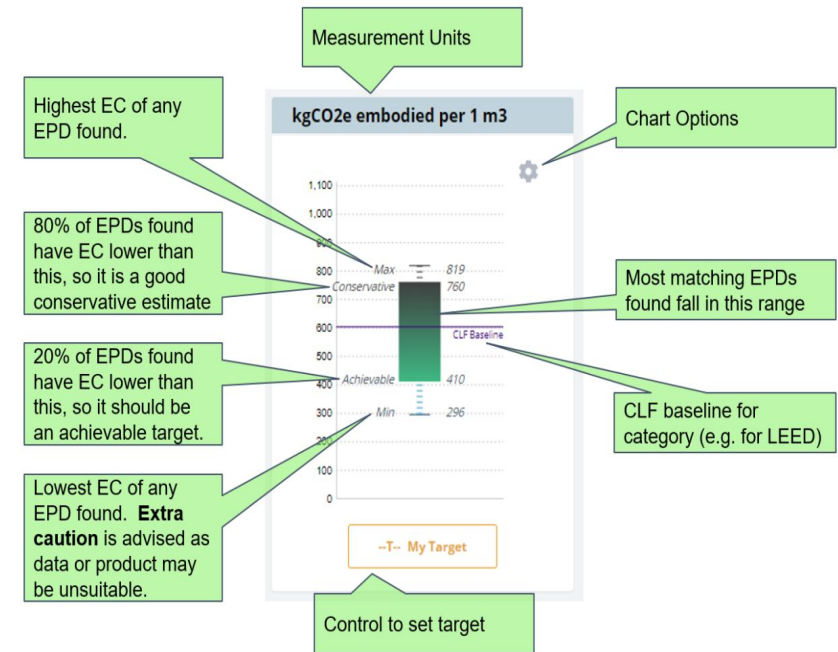
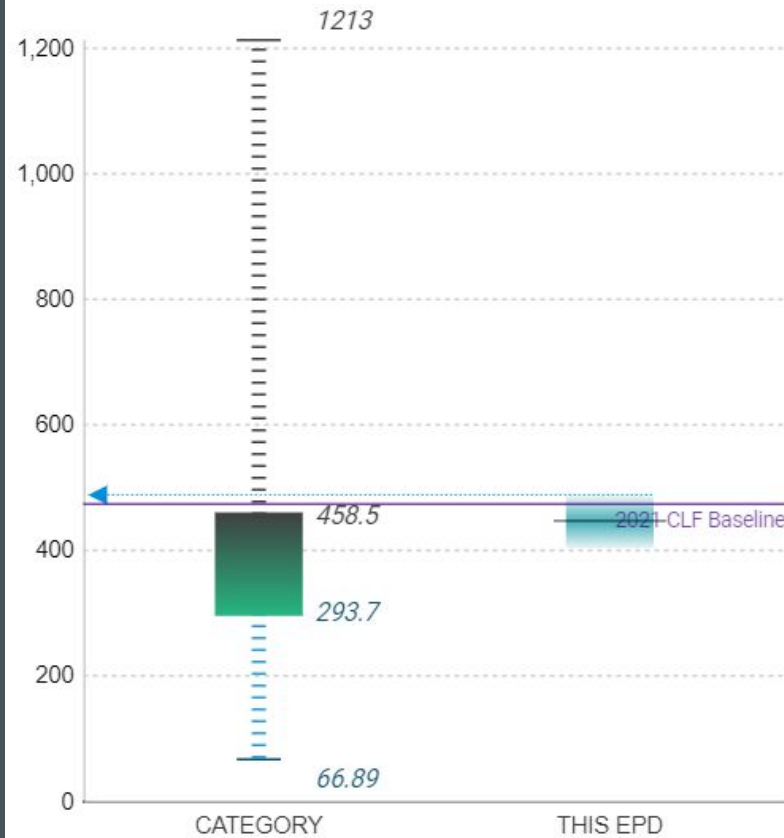
AP = Acidification Potential for Soil and Water, Unit kgSO<sub>2</sub>e

ODP = Ozone Depletion Potential, Unit kgCFC<sub>11</sub>e

POCP = Photochemical smog creation potential, Unit kgO<sub>3</sub>e

# WHAT IS INCLUDED IN AN EPD?

- AVERAGE EPDS FOR GROUPS OF SIMILAR PRODUCTS
- MANUFACTURERS SEEKING TO ALIGN THEIR INDIVIDUAL TYPE III EPDS AGAINST AN INDUSTRY-WIDE AVERAGE EPD SHALL HAVE PARTICIPATED IN THE INDUSTRY-WIDE AVERAGE EPD.



# WHO IS IN CHARGE AT THE FEDERAL LEVEL?

## ■ INFLATION REDUCTION ACT OF 2022 (PUB. L. 117-169)

Section No.	Agency	Funding	Title	Exp. Date
60112	EPA	\$250M	Environmental Product Declaration Assistance	Sep 30, 2031
60116	EPA	\$100M	Low-Embodied Carbon Labeling for Construction Material: <ul style="list-style-type: none"><li>• Identify and label construction materials with lower embodied GHG</li><li>• Production, use, and disposal</li></ul>	Sep 30, 2026
60503	GSA Federal Buildings Fund	\$2.15B	Use of low carbon materials	Sep 30, 2026
60506	DOT FHWA	\$2B	Low-carbon transportation material grants <ul style="list-style-type: none"><li>• Use of construction materials and products that have substantially lower embodied GHG production, use, and disposal</li></ul>	Sep 30, 2026

# EPD's ADOPTION

## ■ California

- The Buy Clean California Act (BCCA) was enacted in October 2017 in an effort to reduce greenhouse gas emissions released during the manufacture and transport of products used in public infrastructure projects.
- The BCCA requires submittal of environmental product declarations (EPDs) for eligible materials or products, including carbon steel rebar, structural steel, flat glass, and mineral wool board insulation.

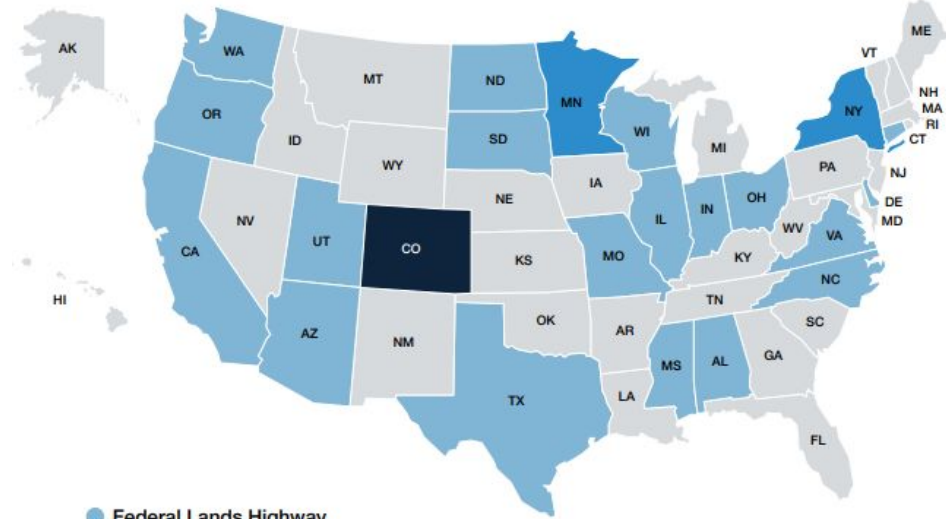
## ■ Colorado

- On July 6, 2021, Gov. Jared Polis signed HB 21-1303 Global Warming Potential For Public Project Materials, requiring Contractors to submit Environmental Product Declarations (EPDs) for all eligible materials to include asphalt and asphalt mixtures, cement and concrete mixtures, and steel.
- Projects with an Engineers Estimate of \$3 million or greater, not including CE, Indirect, and Force Account item costs.
- CDOT EPD Specification: [Environmental Product Declarations \(EPD\) — Colorado Department of Transportation \(codot.gov\)](https://www.codot.gov/epd-specification)

## ■ Oregon

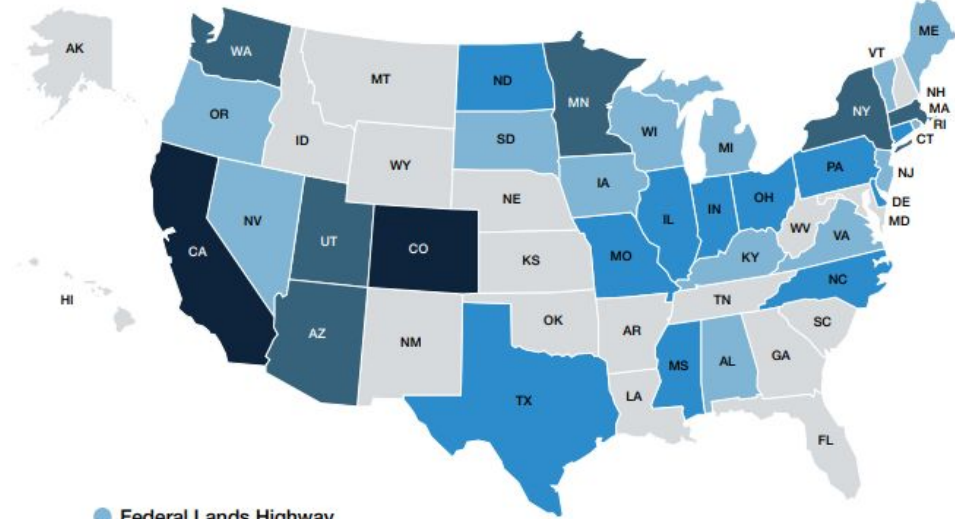
## ■ Minnesota

Baseline (April 2023)



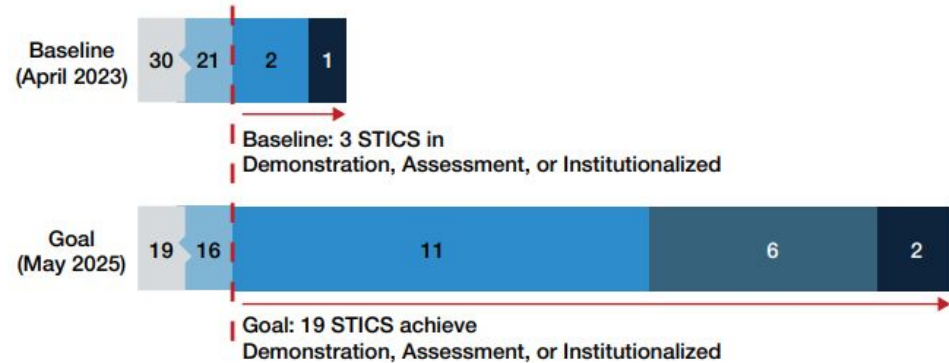
- Federal Lands Highway
- Puerto Rico
- US Virgin Islands
- Washington DC

Goal (May 2025)



- Federal Lands Highway
- Puerto Rico
- US Virgin Islands
- Washington DC

[Detailed data representing each State's progress is available in the appendix.](#)



- Institutionalized
- Assessment
- Demonstration
- Development
- Not Implemented

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THANK YOU

