



Environmental Product Declarations (EPDs) for Asphalt Mixtures

A Brief Overview and Current State of Use

**New Jersey Asphalt
Pavement Association**

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Pavements

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Introduction to EPDs

What is an EPD?

- **Environmental Product Declaration**

- **Quantified** environmental information on the **life cycle** of a product to enable **comparisons** between products fulfilling the **same function***

- **“Nutrition label” for environmental impacts**

- **Independently verified**



EPD “Nutrition” Label

Your Building Product

Amount per Unit

LCA IMPACT MEASURES	TOTAL
Primary Energy (MJ)	12.4
Global Warming Potential (kg CO ₂ eq)	0.96
Ozone Depletion (kg CFC- 11 eq)	1.80E-08
Acidification Potential (mol H ⁺ eq)	0.93
Eutrophication Potential (kg N ⁻ eq)	6.43E-04
Photo-Oxidant Creation Potential (kg O ₃ eq)	0.121

Your Product's Ingredients: Listed Here

<https://westcoastclimateforum.com/cfpt/concrete/strategy1>

*Source: ISO 14025:2006. EPDs from different Product Categories should NOT be compared to each other.

Types of EPDs



Industry-Wide

ENVIRONMENTAL PRODUCT DECLARATION

NORTH AMERICAN SOFTWOOD PLYWOOD

AMERICAN WOOD COUNCIL
CANADIAN WOOD COUNCIL



The American Wood Council (AWC) and the Canadian Wood Council (CWC) are pleased to present this Environmental Product Declaration (EPD) for North American softwood plywood. The EPD includes Life Cycle Assessment (LCA) results for all processes up to the point that plywood is packaged and ready for shipment at the manufacturing gate. The underlying LCA and the EPD were developed in compliance with ISO 14025:2006 and ISO 21930:2017 and have been verified under the UL Environment EPD program.

The AWC and CWC represent wood product manufacturers across North America. The North American forest product industry is a global leader of sustainably sourced wood products. This EPD reflects years of research and numerous sustainability initiatives on behalf of our members to continually improve the environmental footprint of North American wood products. We are pleased to present this document to show our progress.

Please follow our sustainability initiatives at www.awc.org and www.cwc.ca.



Product-Specific



Third party verified EPD – According to the International EPD® system

Interpon D1000

Interpon D2000

Interpon D3000



First date of publication: 06 April 2015
Valid until: 02 May 2023
PCR reference: CPC division 3511 Paint and varnishes
PCR 2012:01 CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES; ver.2.2 of 2017-05-30
Registration number: S-P-00692
Revision date: 03 May 2018
Verified by: NEVEN Miljokonsult
Programme operator: The International EPD® System
Declaration owner: AkzoNobel Powder Coatings B.V.

Plant-Specific & Product-Specific

Durum Wheat semolina pasta

in paperboard box

Environmental
Product
Declaration



The first EPD process certified in the Food industries



REGISTRATION
NUMBER
S-P-00217

CPC CODE
2731 Uncooked
pasta, not stuffed or
otherwise prepared
PCR 2010:01 v. 3.11
06.09.2019

PUBLICATION DATE
2011/03/10

REVISION
9 of 2020/09/24

VALID UNTIL
2024/11/06

PROGRAMME
The International
EPD® System
www.environdec.com

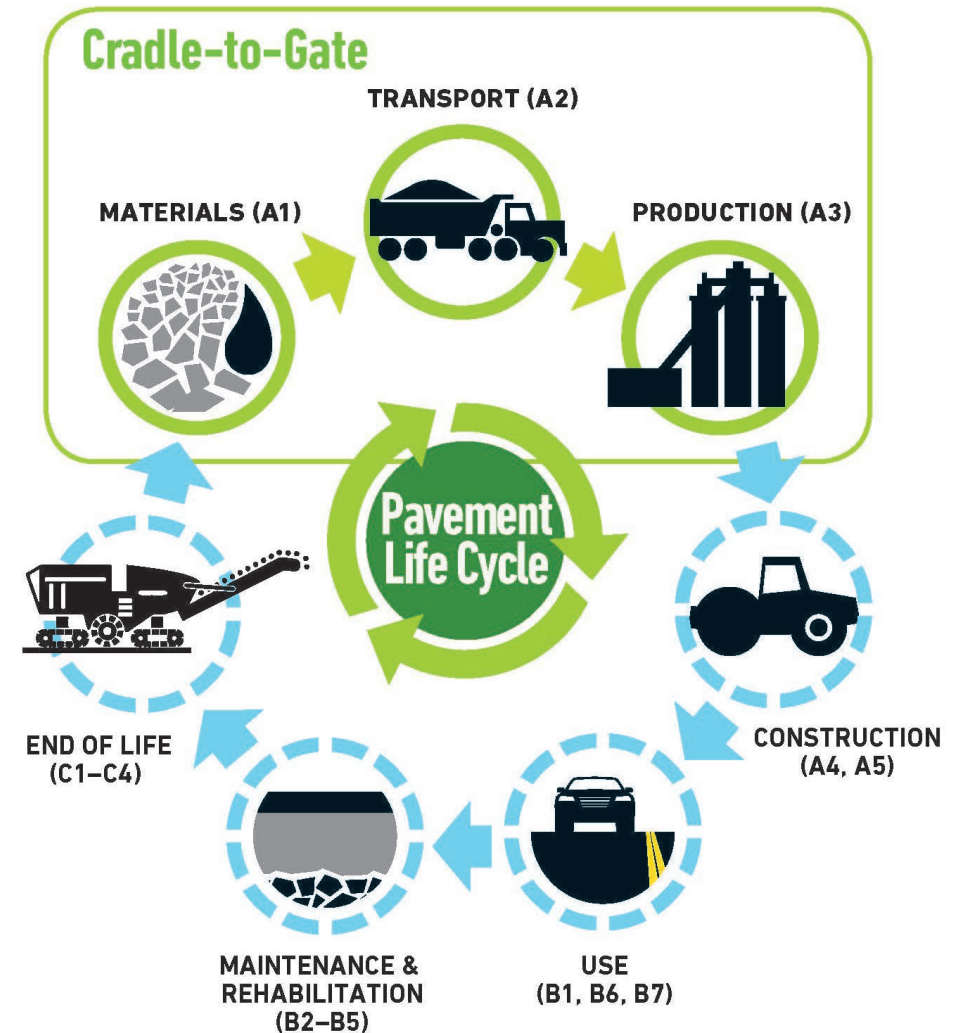
PROGRAMME
OPERATOR
EPD International AB

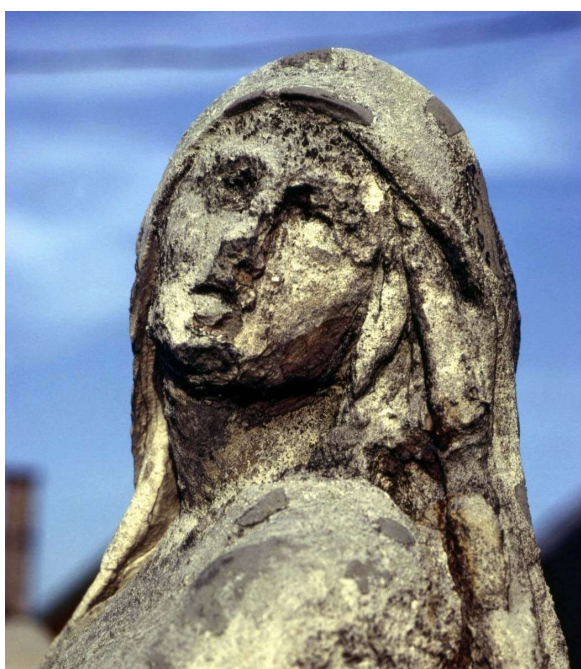
This EPD has been developed in conformity to ISO 14025. An EPD should provide current information and may be updated if conditions change. The stated validity is, therefore, subject to the continued registration and publication at www.environdec.com.

EPDs for Asphalt Mixtures are Plant-Specific & Product-Specific

EPDs for asphalt mixtures have a **Cradle-to-Gate** scope

- **Included:**
 - Materials
 - Transport
 - Production
- **Other life cycle stages are not included**
 - Mix producers have little control over them





Acidification Potential



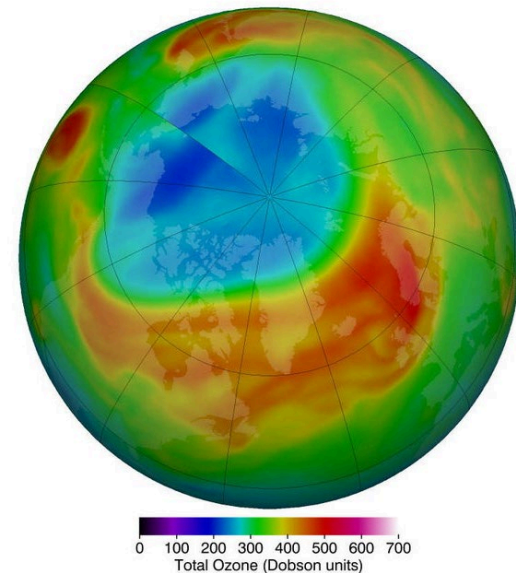
Recycled Materials Use



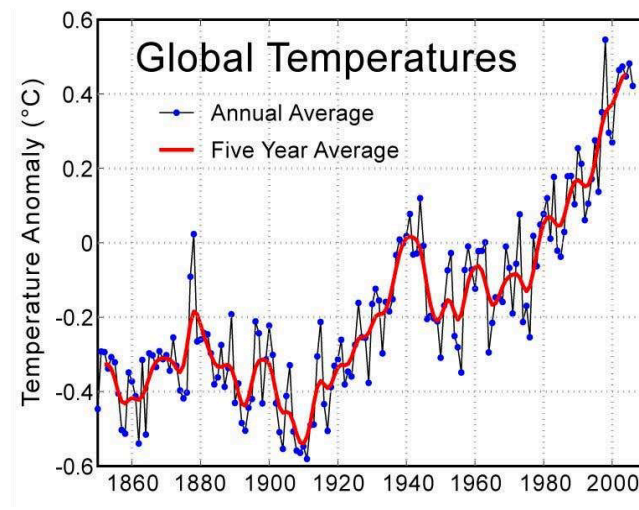
Smog Potential



Renewable Energy Use



Ozone Depletion Potential



Global Warming Potential

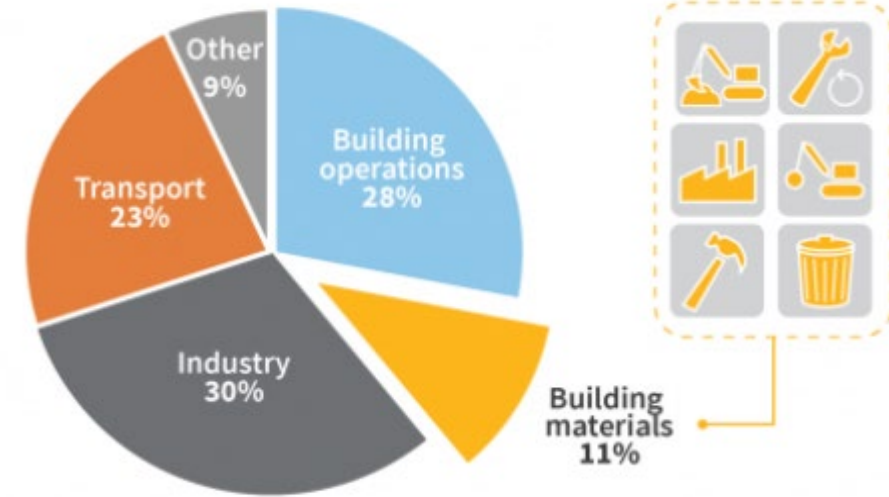
**EPDs report a variety
of potential
environmental impacts and
resource use indicators**

(these are just a few examples)

Understanding Carbon



<https://www.architects.org/news/building-a-low-carbon-future-reducing-embodied-carbon-in-the-built-environment>



Global energy-related CO₂ emissions.
Adapted from the UNEP 2019 Global Status Report

© Copyright 2020, Carbon Leadership Forum

<https://carbonleadershipforum.org/what-is-a-buy-clean-policy/>

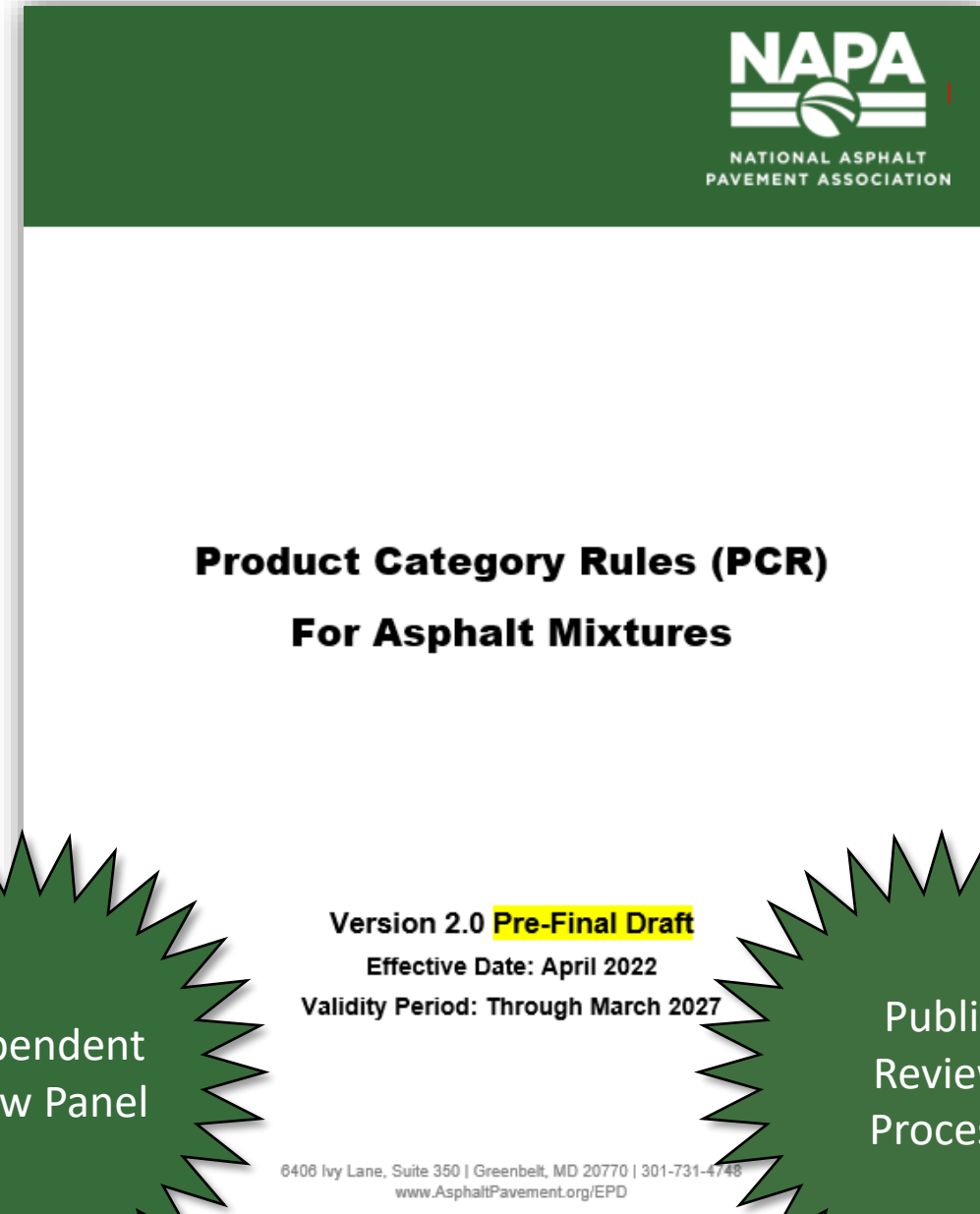
Most EPD policies are focused on **Embodied Carbon**

- Emissions associated with **construction materials**
- Measured using the **Global Warming Potential (GWP)** indicator in **EPDs**

EPD Framework and Standards

PCR for Asphalt Mixtures, v2

- NAPA is the **program operator**
- Complies with **ISO 14025** and **ISO 21930** standards
- **EPDs can be comparable** if asphalt mixtures meet similar performance criteria
- **Declared unit is 1 metric tonne (1 short ton)** of asphalt mixture
- Takes effect April 1, 2022
- More info at <https://asphaltpavement.org/epd>



Life Cycle Assessment (LCA)

- Representative survey of 50 plants
 - Conducted by Dr. Amlan Mukherjee (Michigan Tech)
- Complies with **ISO 14040/14044**
- **Underlying LCA** for the PCR for Asphalt Mixtures
- Also serves as the **LCA model** for NAPA's **Emerald Eco-Label EPD software tool**
- **Revised LCA** has been published for the new PCR

Update to the Life Cycle Assessment for Asphalt Mixtures in Support of the Emerald Eco Label Environmental Product Declaration Program

June 2021



Amlan Mukherjee, PhD, PE
Professor

Department of Civil, Environmental & Geospatial
Engineering

Michigan Technological University
Houghton, MI 49931



Michigan Tech

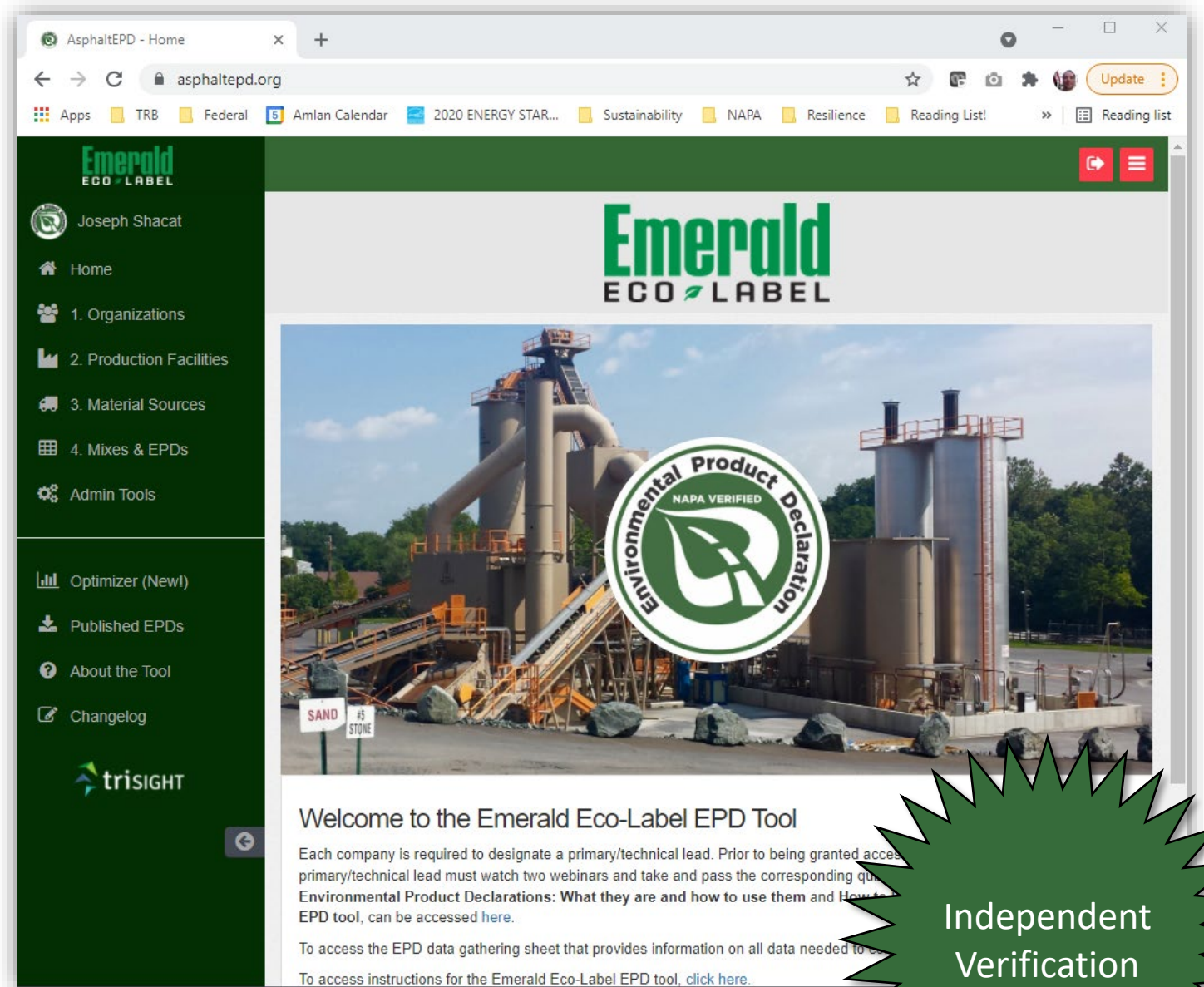
For:

National Asphalt Pavement Association
6406 Ivy Lane, Suite 350
Greenbelt, MD 20770-1441

3rd Party
Critical
Review

Emerald Eco-Label Software

- NAPA's web-based **software tool**
- Asphalt mix producers use it to develop **verified EPDs**
- EPDs are **plant-specific & mix-specific**
- Can be used for **asphalt plants** located in the U.S.
- **Simplified process** that saves mix producers time and money
- **Version 2 launches April 1, 2022**



Independent
Verification

LCA, PCR, and EPD Software Revision Schedule



- **Underlying LCA:**
 - Updated in August 2021
- **PCR status:**
 - Independent review by expert panel is complete
 - New PCR to take effect April 1, 2022
- **EPD Software**
 - Finalizing software development
 - New training webinars in March 2022
 - To be released April 1, 2022



Go to asphaltpavement.org/epd for up-to-date information on the new PCR

How and Why are Pavement Owners Using EPDs?

LEED projects and other green rating systems



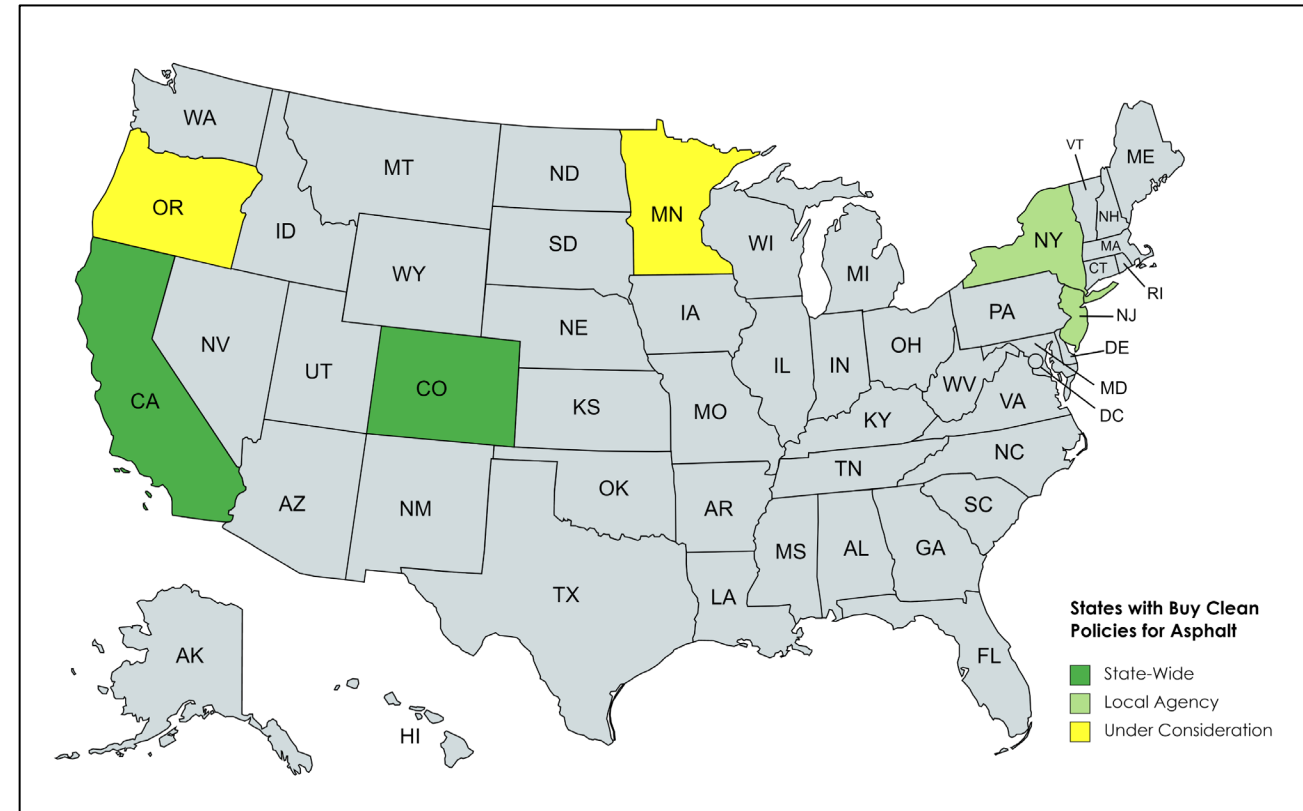
- **EPD credits included in LEED v4 and v4.1**
- **Disclosure credit**
 - Projects collect EPDs from 20 different products
- **1,000+ LEED v4 projects certified in 2020**
 - Schools, banks, warehouses, medical, municipal, restaurants, etc.



"Buy Clean" Legislation

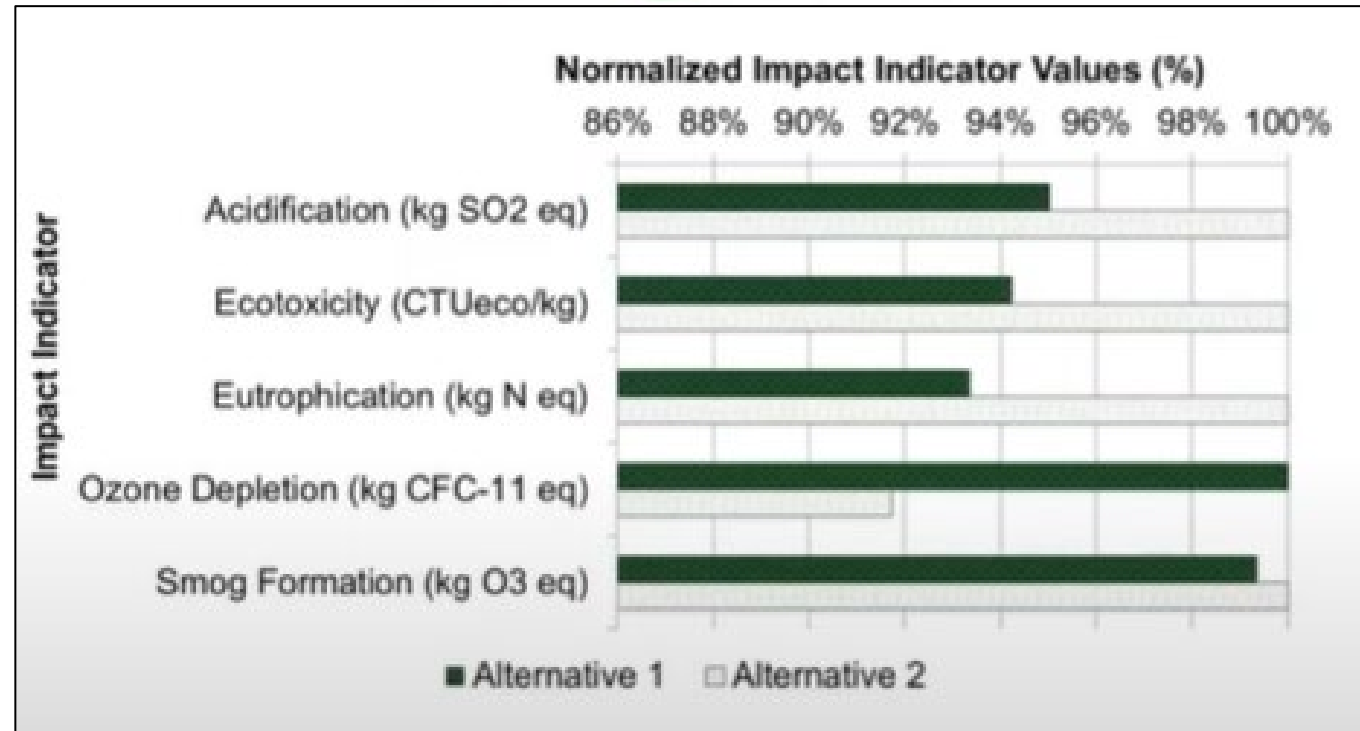
Jurisdictions with Buy Clean policies that include asphalt mixtures

- Caltrans
- Colorado
- Port Authority of New York and New Jersey
- Oregon, Minnesota, other states are considering policies
- **Federal Govt. is establishing a Buy Clean Task Force**
 - GSA to pilot EPDs for projects funded by Infrastructure Act (IIJA)



- **LCA-Pave Software Tool**

- Excel-based LCA software designed for agencies
- Can use EPDs as a data input

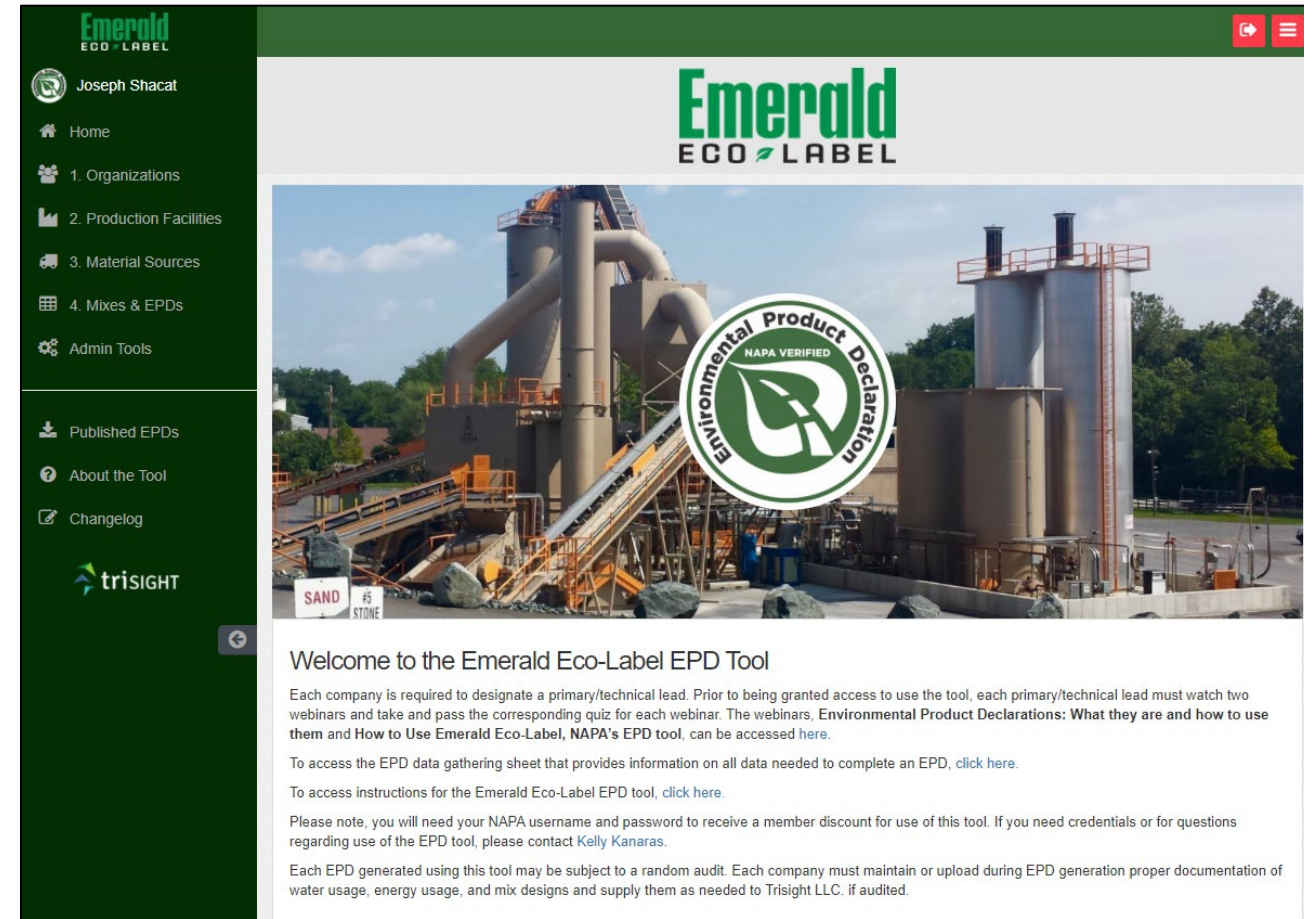


How to use Emerald Eco-Label to Develop an EPD for Asphalt Mixtures

What is Emerald Eco-Label?



- NAPA's web-based **software** tool for asphalt mix producers to develop **verified** EPDs
- EPDs are **plant-specific & mix-specific**
- Can be used for **asphalt plants** located in the U.S.
- **Simplified process** that saves mix producers time and money



How to use Emerald Eco-Label



- **Register** at <https://asphaltepdpd.org/>
- **Watch two webinars** and pass the quizzes
- **Compile data** for plant and mixes
 - Use EPD Data Gathering spreadsheet
- **Purchase access** for your plant(s)
- **Enter data** for plant and mixes to produce EPDs

AutoSave On | EPD Data Gathering rev2 | Last Modified: 7/18/2018 | Search

File | Home | Insert | Page Layout | Formulas | Data | Review | View | Help | Acrobat

H5

Welcome to the EPD Tool data gathering sheet. It is meant to be used in conjunction with the EPD Tool Instructions (pdf).
It is provided to help you gather the relevant data needed to create your first EPD using the Asphalt EPD tool.
The data can be divided into three categories:
1.) Organizational and Production (plant) level information
2.) Supplier level information
3.) Mix level information

Rows 3-40 cover the Organizational and Production level information.
Rows 44-80 are for gathering data on the sources of substances in mixes.
Rows 90-213 are for specifying mixes.

All data entered into the EPD tool is confidential. Only the downstream environmental impacts will appear in the final EPD. No sensitive data about mix design or energy usage will be revealed in the EPD.

trISIGHT

EPD Data Gathering Sheet.
Created by Lianna Miller, Version 2

	Organizational Data	Units	Comments & Help
4	Company Name		In the EPD Tool, "Organization" refers to a whole company. For smaller operations, this may be the same as some of the "Plant" data
5	Contact information for headquarters or billing department		
6	Name and contact information for the person who will be the lead for EPD creation at your company		
7	Production Facilities		
8	Plant name		A user can create multiple plants
9	Physical address		Cannot be a PO Box; The ZIP code will be used for certain calculations
10	Name and contact for head of EPD creation for this plant		May be the same person for several plants. Does not need to be the Technical Lead
11	Production Facility Resource	Units	Comments & Help
12	Annual Production & Electricity		
13	Data collection start date		All quantities reported in the Production Facility section will be over a cumulative period of 12-months, within the last five years. Enter the start date of the twelve month period during which the data was recorded. The reported data for all the subsequent categories (in Production Facility) must have been measured for the same twelve month period starting from this date.
14	Total Asphalt Mix Sold (per year)	US Short Tons	This must be over the same 12 month period as all the other plant data
15	Total Water	Gal	If you have exact (metered) water use data, enter it here. Only water used in asphalt production and dust control should be included.
16	Electricity: Grid Power	kWh	Use your total line electricity for your 12 month period.
17	Automatically computed from ZIP code		This portion will self populate given the zip code of your plant. If you are interested, more about eGRID regions may be found by entering your zip code into the EPA's power profiler: https://www.epa.gov/energy/power-profiler . Your region will appear in bold below the US map.
18	eGRID subregion		
19	Electricity: Solar	kWh	If your plant uses onsite solar sources, report the estimated energy contribution from these sources during your 12-month period here. Note that this is only onsite solar! The percentage of solar from your electricity provider is already calculated.
20	Electricity: Wind	kWh	Electricity generated by onsite wind energy sources. As with solar, only wind power sources that are at your production facility should be accounted for here. The percentage of wind from your electricity provider is already calculated during the

Sheet1

Upstream datasets

- The PCR requires the use of **public datasets** for upstream energy and materials
 - Fuels and electricity
 - Aggregates
 - Asphalt binder
- **Data gaps are noted in the EPD**
 - Binder additives (polymers, ground tire rubber, etc.)
 - Mix additives (WMA, rejuvenators, fibers, etc.)

FEDERAL

COMMONS



EPD Optimizer Tool



- Easily **compare** two of your own mixes to each other
- More **granular analysis** of data
- Create **plant variants** to see how changes to plant operations affect EPDs
- Evaluate **economic** and **environmental** impacts of certain changes
 - Switching fuel types
 - Aggregate moisture reduction



A photograph of an asphalt plant with two large vertical silos, one of which has a logo. A plume of white smoke or steam rises from the top of the silos. In the foreground, there is a road with a yellow sign that reads "SPEED LIMIT 10 YIELD LOADER AHEAD RIGHT OF WAY".

WEBINAR

How to Reduce Costs and Environmental Impacts with NAPA's **Emerald Eco-Label Tool Update**

June 29
1:00-2:30 pm ET

Learn how the new optimizer feature can help you improve asphalt plant operations.

SPEAKER: Ben Ciavola
Partner, Trisight

Recording available on NAPA's store at goaspha.lt/Optimizer.



REGISTER NOW: AsphaltPavement.org/Webinars

Common Questions About EPDs

What is the time and cost of developing EPDs?

Pricing Schedule as of Apr. 1, 2022

Year	Member Rate	Non-member Rate	Years of Tool Access
2022	\$3,000 per plant	\$6,000 per plant	5
2023	\$3,000 per plant	\$6,000 per plant	4
2024	\$2,750 per plant	\$5,500 per plant	3
2025	\$2,500 per plant	\$5,000 per plant	2
2026	\$2,250 per plant	\$4,500 per plant	1

- Initial data collection and plant setup takes most companies a couple of weeks
- New mixes typically take 10-15 minutes



Does the EPD give credit for Warm Mix?

<https://www.fhwa.dot.gov/publications/focus/08apr/03.cfm>



- What are the biggest contributors to GHG emissions?
 - **Burner fuel** consumption
 - **Asphalt binder** content
 - Sometimes, **aggregate hauling** exceeds everything else

Can EPDs for Asphalt Mixtures be Compared to Each Other?

EPDs for different asphalt mixtures are comparable if:

- They perform a similar function and have similar performance characteristics

Examples of mixes that should not be compared to each other:

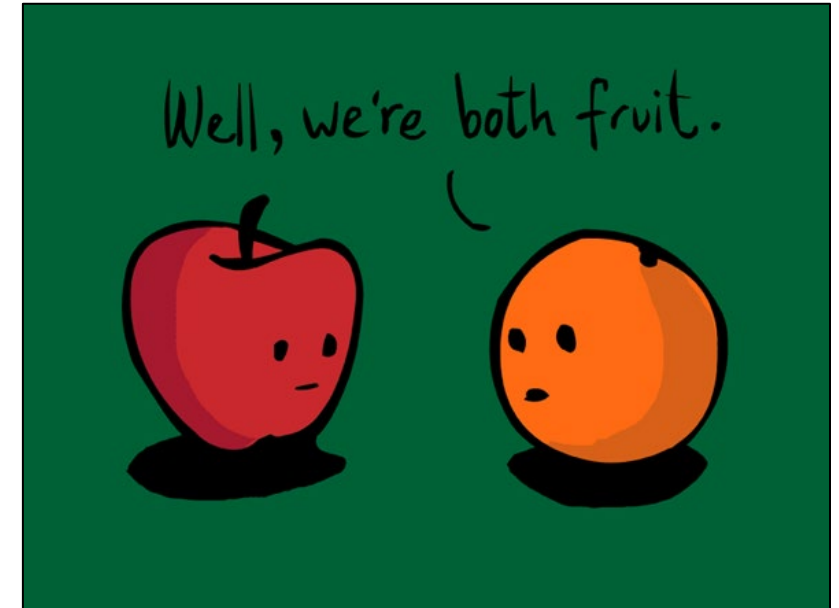
- Polymer modified vs. neat
- Base mix vs. surface mix

Beware of data gaps!



Can EPDs for Asphalt Mixtures be Compared to EPDs for Concrete?

- **Other pavement materials have different PCRs and should **not be compared** to each other:**
 - Ready-mix concrete
 - Precast concrete panels
 - Interlocking concrete pavers
- **Significant differences:**
 - **Declared units** (short ton vs. m³)
 - **Upstream datasets** (fuels, electricity, materials, etc.)
 - **Allocation procedures** (co-products vs recycled materials)
 - **Design** considerations
 - **Maintenance** and **rehabilitation** strategies



But they may not
have the same PCR!

What are the Benefits for Mix Producers



- **Use EPDs for marketing**
 - Attract customers for LEED projects and other green rating systems
- **Use EPDs for advocacy**
 - e.g., demonstrate GHG emission reductions from using RAP
- **Improve your company's environmental performance**
 - Track changes to plant operations and mix designs over time
- **Integrate with corporate sustainability reporting**
- **Demonstrate commitment to sustainability**
 - Attract and retain workforce



Photo courtesy of Lakeside Industries

Thank you, New Jersey!

Gold Club (50+ Years)

- Weldon Materials Inc., Weldon Asphalt Div.

30-Plus Club

- American Asphalt Inc.
- The Walter R. Earle Corp.

- A.E. Stone, Inc.
- Arawak Paving Co. Inc.
- Barrett Asphalt Corp.
- Colas Inc.
- GAF
- Horizon Engineering Consulting
- K&L Gates LLP
- Milano Contracting
- REIVAX Contracting Corp.
- Renda Roads Inc.
- Smith-Sondy Asphalt Construction Co. Inc.

State Advisor: Pete Kochek, Weldon Materials