

MAKING SUSTAINABILITY MEASUREMENTS EASY

Update on the **EPD project** for the National Slag Association annual meeting

Introductions



Lianna Miller

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(Trisight joined WAP Sustainability)

LCA + EPD automation lead

This project has **two parts**:

1. How is the slag industry doing on average?

The industry average EPD + LCA report

2. How can an individual site make EPDs?

The Theta EPD tool

(also, what is **an EPD**?)

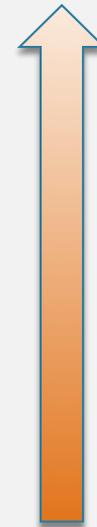
There is a lot of momentum in EPDs

The Inflation Reduction Act earmarks

\$250M for the development of EPDs in public procurement of construction materials

And then **\$2B** to the FHWA to purchase low-carbon materials

And another **\$2.1B** to the GSA for low carbon materials



In addition...

California,

MnDOT,

Port Authority of New York / New Jersey,

Washington,

Colorado,

and the GSA

all have current or pending EPD reqs

Part 1: Industry Average EPD

...or how the industry is doing **as a whole**.

Do the science: LCA (life cycle assessment)

Data gathering

- Information from a **representative sample** of the industry

Types of info

- Administrative basics
- Inputs & outputs
 - Energy, fuels, water, wear parts, etc.
 - Products, byproducts, waste, etc.
- **Only Trisight sees this data!**

We are in this process now.

- Aggregate
- Aggregate operation types
- Asphalt mix - base mix
- Comparison of Bio-Diesel
- Different energy sources
- Electricity Contribution
- ODOT Mixes
- Polymer Modified Binders
- Portable - different fuels
- Portable - distance travelled
- Process - energy calculus
- RAP vs Dist - Tradeoff set-up
- Varying %RAP
- Varying distance - ton-miles
- Product systems
 - Asphalt Mixture LCA Framework
 - Construction Aggregate LCA
 - Aggregate_4A3
 - Aggregate_5B1
 - Aggregate_general_model_parameterized
 - Industrial Explosive Combusted in Ground
 - Manganese steel - ben
 - Manganese steel for crushers
 - Electricity Baseline
 - Related Construction Materials
 - Upstream Inventories
 - Analysis test - Steel, billets, at plant
 - Asphalt mixture - 2019 Average
 - Asphalt mixture - IPC Parameters
- Processes
 - 11: Agriculture, Forestry, Fishing and Hunting
 - 21: Mining, Quarrying, and Oil and Gas Extraction
 - 22: Utilities
 - 23: Construction
 - 31-33: Manufacturing
 - 42: Wholesale Trade
 - 44-45: Retail Trade
 - 48-49: Transportation and Warehousing
 - 56: Administrative and Support and Waste Management

General information

Product system: Aggregate_general_model_parameterized

Allocation method: As defined in processes

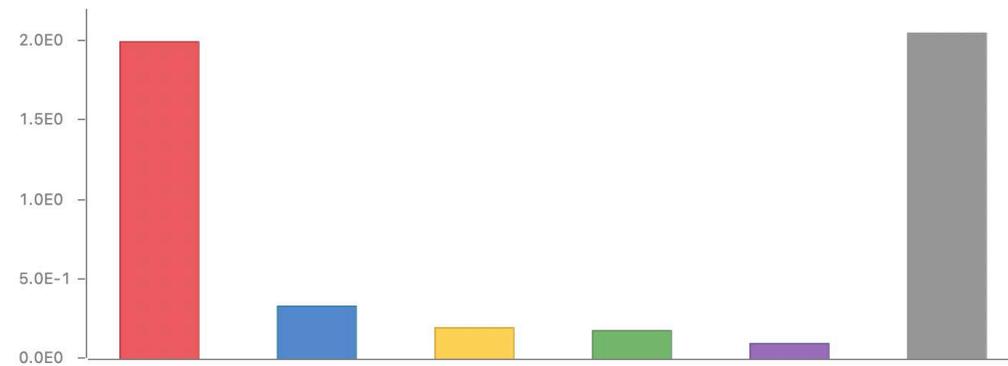
Target amount: 1.0 sh tn Aggregate_crushed_washed

Impact assessment method: TRACI 2.1

Export to Excel Save as LCI result

Top 5 contributions to impact category results - overview

Impact category: Global warming



Top 5 contributions to flow results - overview

.....run the analysis.....

...and output the industry average EPD (Environmental Product Declaration)

Results of the LCA – Environmental Impact, TRACI

PARAMETER	UNIT	A1	A2	A3
Global Warming Air, incl. Biogenic Carbon	[kg CO2-Equiv.]	39	12.4	3.61
Ozone Depletion Air	[kg CFC 11-Equiv.]	7.98e-09	5.26e-10	3.44e-11
Acidification	[kg SO2-Equiv.]	0.23	0.0608	0.00763
Eutrophication	[kg N-Equiv.]	0.0147	0.00392	0.000487
Smog Air	[kg O3-Equiv.]	4.31		
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*		

Results of the LCA – Environmental Impact

PARAMETER	UNIT	A1	A2	A3
Global Warming Potential	[kg CO2-Equiv.]	39.8		
Ozone Layer Depletion Potential	[kg R11-Equiv.]	6.5e-09	4.8e-10	3.14e-11
Acidification Potential	[kg SO2-Equiv.]	0.19	0.045	0.00555
Eutrophication Potential	[kg Phosphate-Equiv.]	0.0228	0.0101	0.00135
Photochem. Ozone Creation Potential	[kg Ethene-Equiv.]	0.0255	0.00223	0.000987
Abiotic Depletion	[kg Sb-Equiv.]	MND*	MND*	MND*
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*	MND*	MND*

EPDs are the gold standard for reporting environmental impacts *without* revealing operations details



The industry average EPD meets many needs

Fills the gap in slag impact data,

Meets ISO 14025 and 14044 standards,

Is third-party reviewed,

Follows the latest, updated PCR, and

Uses economic allocation to fairly apportion upstream impacts with steel

Also output the **LCA report**, which...

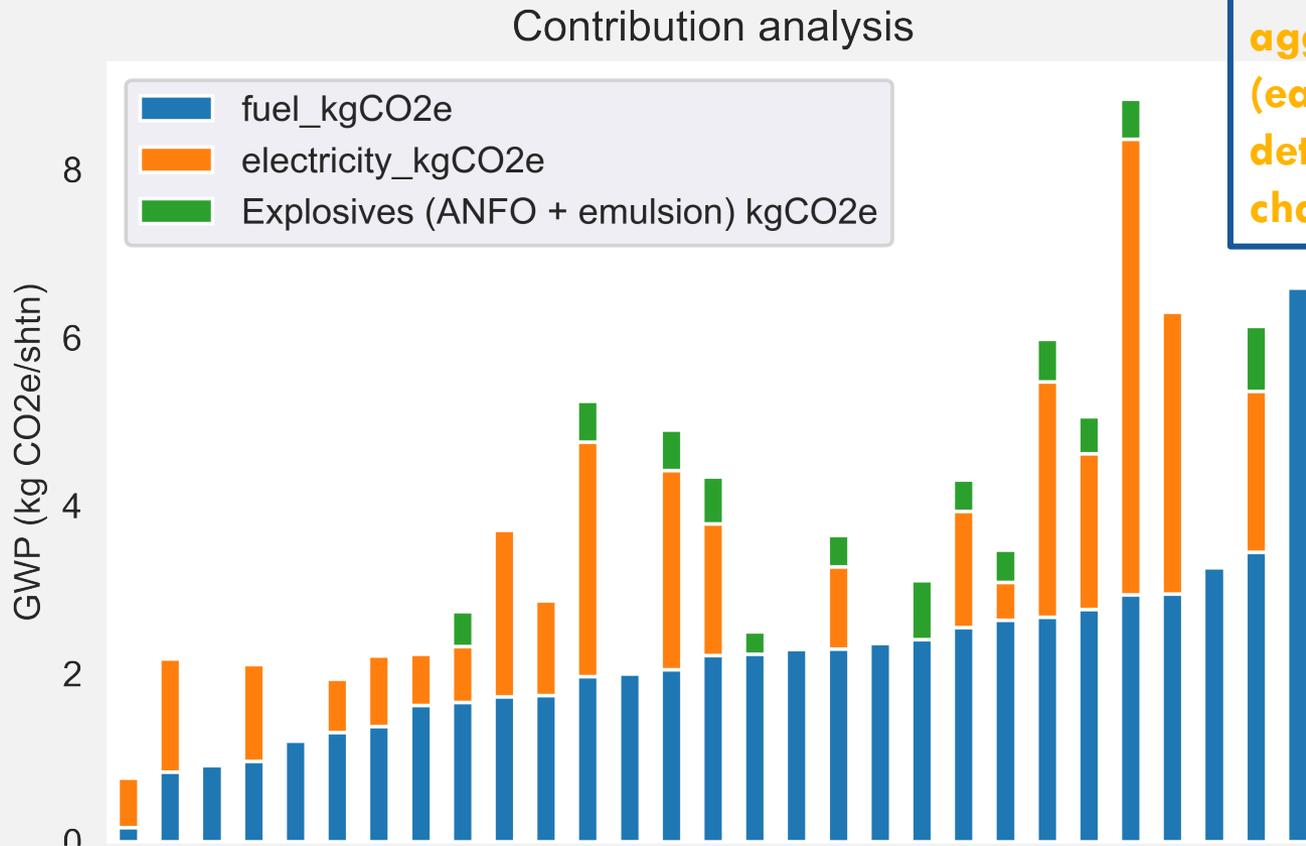
Gives detailed information and trends

Does not reveal operational details or individual data

Contains insights from the analysis for the slag industry

Is not publicly available

We can see trends in environmental impacts across the industry



Example from aggregate LCA (early data, details may change)

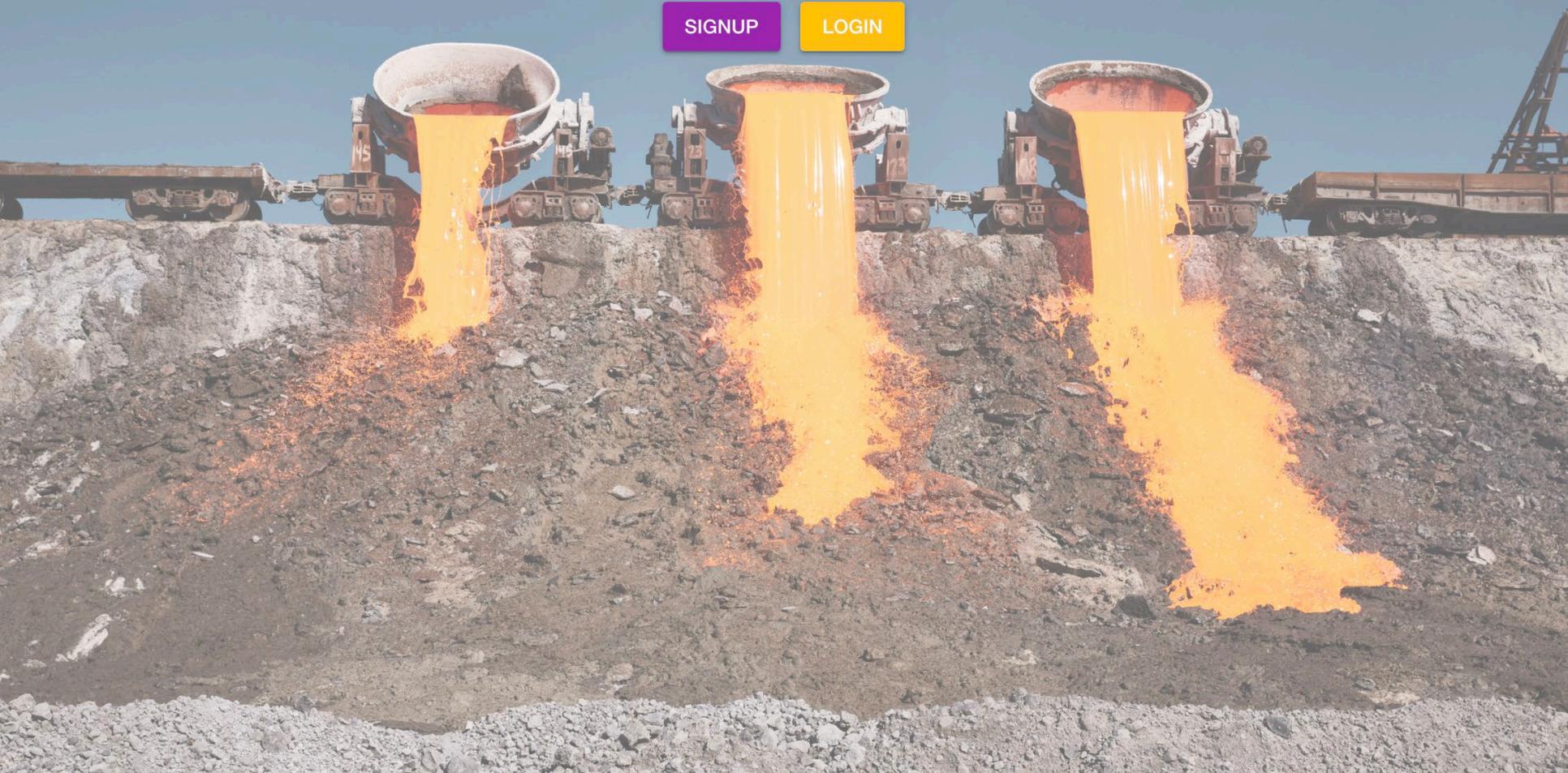
Part 2: the **Theta EPD tool**

...or how can my site get individualized results?
And why would I want that?

ΘEPD *Slag Aggregates*

[SIGNUP](#)

[LOGIN](#)



Facility Information

Enter your facility's location and production information below.

Production	Total	
	55000	shtn
Total production		
Enter the total mass sold from this facility during the data collection period.		

Coproduction	Mill Type	
	Electric Arc Furnace	▼
Select the type of steel mill at this facility.		

Water Usage	Total Water	
	1500000	gal
	Dust Control	
	250000	gal
	Washing	
		gal

Water Source	Well	
		gal
	Municipal	
		gal
	Ponds	
		gal



EPD Slag Aggregates

Company

WebinarTestOrg is an asphalt mixture producer.

WebinarTest Plant

11 plant street
Nome, AK

Product Description

This EPD reports the impacts for Test Mix 1, a Testing asphalt mixture which can be incorporated as part of the structure for a roadway, parking lot and recreational pavement and meets mix specifications provided for its application.

This asphalt mixture is categorized as a hot mix. This asphalt mixture was produced within a temperature range of 150.0 to 185.0 °F.



Declaration Number: 6.4.2.4

Date of Issue: Aug 22, 2018

Period of Validity: Jan 31, 2022

This declaration is an environmental product declaration in accordance with ISO 14025:2006¹ Type III environmental performance labels and European Committee for Standardization (CEN) EN 15804:2012², which transparently describes the potential environmental impacts of the described product caused during the identified stages. The data specific to this product can be found on page 3 of this document.

data within the system boundaries.²

Structures

Environmental Impacts

Impact assessment results are relative expressions predict actual impacts on category endpoints, % of thresholds, safety margins, or risks.

Information

Information presented in this EPD can be used to model potential impacts of asphalt mixtures purposed to be used (not limited to) roadway, parking lot or recreational pavement. This EPD alone does not provide the environmental performance of the entire pavement structure itself and does not indicate that the product covered by the EPD is superior to any other product.

Due to the environmental performance of asphalt mixtures, the EPD information shall be based on the product's use and function, and therefore EPDs shall not be compared for parability purposes when the asphalt mixture and functions are not the same. NAPA verified that the EPDs that are expected to meet the same use and function can be compared. EPDs of other products are not comparable because they could be based on a different PCR.

Environmental Information

Notes on Limitations

This EPD reports the results of a cradle-to-gate LCA for asphalt mixtures. This EPD may be used as a data input for full life cycle assessment to compare the environmental impacts of different pavement designs, roadway, parking lot, or recreational pavement design.

The amount of recycling asphalt shingles was estimated using data from reclaimed asphalt pavement. The source of the asphalt (whether from a quarry or manufacturing waste) is not being reported.

Impacts

	A2	A3
		6.49e+04
		0
		6.49e+04
03	46.9	0
03	46.9	0
	0	0
	0.033	0.000168

non renewable primary energy resources used in the production of materials
use of non renewable primary energy resources and primary energy resources used in the production of secondary materials
renewable secondary fuels
non renewable secondary fuels
consumption of fresh water

Impacts

	A2	A3
		0
		0
		0
		0
		0
		0
		0

Impacts for recycling
Impacts for energy recovery
Exported electrical energy
Exported thermal energy

Impacts

	A2	A3
		3.61
2-10		3.44e-11
08		0.00763
392		0.000487
		0.261
r*		MND*

	A2	A3
		3.59
-10		3.14e-11
5		0.00555
01		0.00135
223		0.000987
r*		MND*
r*		MND*

2

CRU Components for reuse

EET

*Module Not Disclosed: Insufficient data available to calculate this value

3

4

Goals of project

- Create a **realistic baseline** for the industry
- **Be ready** for legislation, customer requests
- Make it **easy to get** slag **EPDs**

QUESTIONS?

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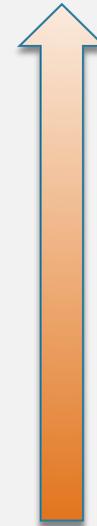
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